

Everyman's Encyclopædia

IN TWELVE VOLUMES

VOLUME THREE

Bulgaria
TO
Coal-fields

THE THIRD EDITION

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BULGARIA — COAL-FIELDS

EDITED BY ATHELSTAN RIDGWAY, LL.B.



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ABBREVIATIONS

The titles of subjects, which are printed first in bold type, have been abbreviated within each article to the initial letter or letters.

ac., acre(s).
 agric., agricultural.
 ambas., ambassador(s).
 Amer., American.
 anct., ancient.
 ann., annual.
 arron., arrondissement.
 A.-S., Anglo-Saxon.
 A.V., Authorised Version.
 b., born.
 Biog. Dic., Biographical Dictionary.
 bor., borough.
 bp., birthplace.
 Brit., British.
 C., Centigrade.
 c., about.
 cap., capital.
 cf., compare.
 co., county.
 com., commune.
 cub. ft., cubic feet.
 d., died.
 Dan., Danish.
 dept., department.
 dist., district.
 div., division.
 E., east; eastern.
 eccles., ecclesiastical.
 ed., edition; edited.
 e.g., for example.
 Ency. Brit., Encyclopædia Britannica.
 Eng., English.
 estab., established; establishment.
 F., Fahrenheit.
 fl., flourished.
 fort. tn., fortified town.
 Fr., French.
 ft., feet.
 Ger., German.
 Gk., Greek.
 gov., government.
 Heb., Hebrew.
 hist., history.
 horticult., horticultural.
 h.p., horse-power.
 hr., hour.
 i.e., that is.
 in., inch(es).
 inhab., inhabitant(s).

is., island(s).
 It., Italian.
 Jap., Japanese.
 jour., journal.
 Lat., Latin.
 lat., latitude.
 lb., pound(s).
 l. b., left bank.
 long., longitude.
 m., mile(s).
 manuf., manufacture.
 min., minute(s).
 mrkt. tn., market town.
 MS., manuscript.
 mt., mount; mountain.
 N., north; northern.
 N.T., New Testament.
 O.E., Old English.
 O.F., Old French.
 O.T., Old Testament.
 oz., ounce(s).
 par., parish.
 parl., parliamentary.
 pop., population.
 prin., principal.
 prof., professor.
 prov., province; provincial.
 pub., published; publication.
 q.v., which see.
 R., riv., river.
 r. b., right bank.
 Rom., Roman.
 R.V., Revised Version.
 S., south; southern.
 sec., second(s).
 sev., several.
 Sp., Spanish.
 sp. gr., specific gravity.
 sq. m., square mile(s).
 temp., temperature.
 ter., territory.
 tn., town.
 trans., translated; translation.
 trib., tributary.
 univ., university.
 urb., urban.
 vil., village.
 vol., volume.
 W., west; western.
 Wm., William.
 yd., yard.

The article ABBREVIATIONS contains a list of those in general use.
 See also ABBREVIATION (music) and ELEMENTS (chemical symbols).

Bulgaria, republic lying between Rumania and Greece on the N. and S. and Yugoslavia and the Black Sea on the W. and E. N. B. proper is separated from S. B. (E. Roumelia) by the Balkan Mts. A plateau region descends by successive terraces from the Balkan Mts. to the Danube, by which the country is separated from Rumania, and is crossed by the deeply eroded channels of the tribs. of that riv., the Tarak, Lom, Isker, Vid, and Osma. The Rhodope Mts., rising in parts to a height of 7200 ft., separate B. from Greece. Between that range and the Balkans stretches the plain that is watered by the Maritza and its tribs. The climate is characterised by hot, dry summers, and short, dry winters, rainy springs and autumns, and a wide range of temp., but it is healthy except in the marshes along the rivs. and the Black Sea. Forests, composed mainly of oak, sumach, thorn, elder, cover over 7,000,000 ac., and orchards of plums, walnuts, apples, pears, and cherries occur frequently, particularly near Kustendil. Bear, wild boar, red and roe deer, chamois, eagles, wild fowl in the marshes, and partidges, wolves, squirrel, and marmot are plentiful everywhere. Sturgeon are taken in the Danube, trout in all streams, and mackerel (for drying) in the Black Sea near Burgas. The chief domestic animals are horses (small and hardy, for riding only), asses and mules, buffaloes, sheep, oxen, goats, and swine. Coal is the most plentiful of minerals, the chief mines being the State-owned ones of Pernik, Maritza, and Bobovdoli; these mines produce about 1,500,000 tons yearly for home needs. Other exploited minerals are copper, lead, zinc, aluminium, and salt, but mining development is slow. There are also a number of mineral and thermal springs. The chief occupation of the people is agriculture, which engages about 80 per cent of the pop., but, nevertheless, of an area of 26,000,000 ac., only one-third is cultivated. The land is divided for the most part into small holdings, held in absolute freehold by the proprietors, and there is a land-tax. Agric. methods are primitive. Cereals (wheat, maize, rye, barley, oats) are the prin. crops, and rank first among the exports. Wine is produced everywhere, especially near the Black Sea. Roses are cultivated to a large extent, especially round Kazanlik and Karlovo and on the N. side of the Rhodope Mts., for attar of roses, which is largely exported. Silk-worms are bred in Plovdiv and Haskar. Tobacco is cultivated and forms one of the chief articles of export; cotton and sugar-beet are also grown. Industry is backward, but was improving in the decade before the Second World War. Besides the native branches, which include

the production of native cloth, carpets, trimmings, and ribbons, there are some brewing and distilling (slivovitsa from plums), leather work at Sumen, copper work, and pottery making. Works had also been estab. to manuf. textiles, both wool and cotton, leather, metal goods, chemicals, and soap. Flour milling and sugar refining are the two chief industries. Chief exports are grain, tobacco, silk cocoons, live-stock, butter, eggs, hides, attar of roses, charcoal, sunflower seed and cake, hardwoods, beans, nuts, copper matte, and lead ore, sent chiefly to Turkey, France, United Kingdom, Austria, and Hungary. The pop. consists of Bulgarians, Turks, Gks., Sp. Jews, and gipsies, though three-quarters are Bulgarians. Bulgars are descended from Finno-Ugric Bolgari, but have been thoroughly Slavised. The Orthodox Gk. Church is the State religion, and has over 5,000,000 members. There are also 821,000 Moslems (Pomaks) and 45,000 Rom. Catholics. In 1916 the Gregorian calendar came into force. Elementary education is compulsory up to the 4th standard and free up to the 7th standard, i.e. for children between the ages of seven and fourteen, and illiteracy is decreasing (about 20 per cent of the male, and over 40 per cent of the female, pop. were illiterate before the Second World War). There is one univ. at Sofia (4400 men and 1650 women students and 285 profs.), and B. has also sev. technical schools.

Executive power until Sept. 1946 was vested in the Council of Regency on behalf of the tsar and is exercised by a council of ministers. The legislature is a unicameral National Assembly or Sobranje of 160 deputies, elected for four years by adult manhood suffrage and married women. The Sobranje was suspended from 1934 to 1938, though elections were held in 1938. The Vienna to Constantinople railway runs through the cap., Sofia, and Plovdiv. Altogether there are 1750 m. of ordinary gauge railway and some 260 m. of narrow gauge, all State owned; there are over 15,000 m. of good roads. Before the First World War, military service was compulsory, but by the terms of the treaty of Neuilly, 1919, compulsory military service was abolished, and the total military force could not exceed 20,000 men, but these limitations were abolished by the Salonika agreement of 1938. Bulgarians are, as a rule, of smaller stature than their neighbours. They are powerfully built, laborious, and sensible. They are thoroughly domesticated and love their homes and family. The chief tns. of B. are Sofia, Plovdiv, Rustchuk, and Varna. Sofia is the cap., and is situated on the R. Isker. It is a busy place of trade in consequence of

its important position on the Vienna-Constantinople railway. It has a pop. of (1942) 400,000. Varna (80,000) on the Danube is the largest Black Sea port. Bourgas (40,000) is also a Black Sea port. Plovdiv was the cap. of E. Roumella. It exports attar of roses. Rice, the vine, cotton, and olives also grow in the valley. It has a pop. of over 110,000. Rustchuk is a large riv. port on the Danube, with a pop. of 50,000. Other tns. are Plieven (36,000), Vidin (20,000), Lom (17,000), and Svistov (14,000). Pop. of B. (1940) 6,700,000. Area (with S. Dobrudja) about 43,000 sq. m.

thus weakening the Bulgarians in their rivalry with Byzantine emperors. At the end of the tenth century part of E. B. was incorporated with the Byzantine Empire, and in 1018 the W. Bulgarian kingdom became a Byzantine prov. In 1186 a third Bulgarian kingdom was formed by a successful rebellion, and remained until the arrival of the Osmanli Turks. The Gks. hated and abused the Bulgarians to such an extent that the word B. became a byword among the European nations. An attack on Constantinople by Bulgars and Serblans was repulsed, and the Bulgarian cap. was



THE VALLEY OF THE ISKER, NEAR KARLUKOVO, BULGARIA

E.N.A.

Historical.—B. was originally inhabited by Thracians, and under the Romans formed the prov. of Moesia. Later it was occupied by the Slavonic Slavonians. The Bulgars were originally a Ural-Altaic people. They came from the banks of the Volga and crossed the Danube in the sixth century, and occupied the E. They overcame the Slavs, adopted their language and customs, and thus became a great Slav power. In 864 Prince Boris, their chief, was baptised, and the Bulgarians became dependent on the patriarchate of Constantinople. The Bulgarians were victorious against the Magyars and Gks. in the ninth and tenth centuries. Simeon, their prince, assumed the title of 'Autocrat of all the Bulgarians and of all the Gks.,' and Serbs and Byzantines paid tribute to him. The Bulgars dominated Macedonia, Thessaly, Epirus, and Albania. In 963 the W. part of B. broke away and formed a new kingdom,

taken in 1393. Under the influence of Byzantium and of Christianity, B. had attained in the Middle Ages a degree of civilisation equal to that of W. nations, but this was destroyed by the invasions of Tatars and Osmanli. For close upon 500 years the Bulgars were subject to the tyrannous rule of the Ottoman Empire. About the middle of the nineteenth century the unconcealed aspirations of the Christians attracted the suspicions of the Muslims and Turkish inhab. of B. These rose against their unarmed neighbours, and assisted by the bashi-bazouks (or body of irregular troops), destroyed villages wholesale. In the prov. of Plovdiv and dists. around, more than fifty-eight vils. were destroyed in a few months, and men, women, and children were cruelly slain. These 'Bulgarian atrocities' awakened horror throughout Europe, and especially in England, and suggestions

were made of forming two autonomous states. The Porte refused to make concessions, and in 1877 Russia, as guardian of the Slav races of Turkey, declared war. As a result of the war, the Berlin Treaty (1878) constituted an autonomous though tributary B., N. of the Balkans, whilst to the mainly Bulgarian prov., S. of them, known as E. Roumelia, it granted administrative autonomy. In 1885 E. Roumelia was incorporated with the Bulgarian state. Taking advantage of the Young Turk revolution, 1908, and Austria's annexation of Bosnia-Herzegovina, Prince Ferdinand repudiated the last shred of Turkish suzerainty and proclaimed himself tsar. This action was allowed to stand by the great powers. In 1912, B. with Serbia, Greece, and Montenegro formed the Balkan League, and with its allies formulated the demands which led to the Balkan war (*q.v.*) between the League and Turkey. To B.'s lot fell the heaviest fighting, and it is hardly too much to assert that the successful issue of that war was due, in the main, to the valour of the Bulgarian troops, and the martial skill of Gen. Savoff. See BALKAN WAR AND TURKEY.

Bulgaria and the First World War.—B. entered the war in Oct. 1915, and almost exactly three years later surrendered unconditionally to the Entente forces. The hist. of this ill-starred country, after it became a sovereign independent state, was one of victimisation to dynastic ambitions. After the abdication of Prince Alexander of Battenberg in 1887 the throne was offered to Prince Ferdinand of Saxe-Coburg, who inherited the overweening ambition of his mother, Princess Clementine. On the death of his first wife, the Grand Duchess Marie of Parma, Prince Ferdinand married Princess Eleanor of Reuss-Kostritz. In 1908 Ferdinand proclaimed himself king of B. and, three years later, changed his title to tsar. There can be but little doubt that the misfortunes of his country may be attributed to the overmastering aspirations to power of this monarch, who, after the fiasco of the Balkan wars of 1912-13 sought to retrieve his country's ruin by intrigues with Germany, the outcome of which was the loss of his crown and, to the country, not only of everything it had won in the Balkan wars, but of its prosperity for years to come.

It was obvious at the very outset of the First World War that B., standing in the highway of Ger. aspirations S.E. to Bagdad, would sooner or later be involved. What was not obvious, at least to the Entente diplomats, was that the Bulgarian king and his Cabinet had definitely decided, long before the Bulgarian armies crossed the Serbian border late in 1915, to throw in their lot with the Central Empires. King Ferdinand's object was nothing less than aggrandisement. He had visions of the sure triumph of the Central Empires, with Germany's trade and prosperity reaching out overland towards India and his own kingdom, enlarged beyond recognition, a member of the new Kaiserbund of *Mittel Europa* and

the natural corridor between the new Germany and Asia Minor, and the custodian of the great Ger. railway from Berlin to Bagdad. But as regards the Bulgarian people at large, ill-educated peasantry for the most part, it may be assumed that the one thing, if any, that stimulated their war ardour was their fear of the creation of a Greater Serbia. The annihilation of King Peter's kingdom was the best means of averting this fear, and it was no less a means of clearing the Ger. route to Bagdad. Thus, the Bulgarian people, or at least a majority, and the king were in agreement, though what King Ferdinand regarded as a means to an end, the people looked upon as the end itself. By preserving outwardly a neutral attitude, while in secret sympathy with the Central Empires, B. was able or hoped to secure the neutrality of both Greece and Rumania; immensely to strengthen the position of Turkey and thwart the allied Gallipoli expeditionary force of any chance of success; to disperse the allied effort into Syria, Mesopotamia, and Salonika instead of permitting it to be concentrated on the Danube; eventually to open to the Austro-Ger. armies the road eastward through Serbia; by the ultimate debacle of the Serbian army to render possible the Bulgarian acquisition of Thrace, Macedonia, and most of Serbia; to avert the possibility of the union of the Serbs, Croats, and Slovenes in a single state; and, finally, to secure the hegemony of the entire Balkan Peninsula. Early in 1915 Venizelos (then Prime Minister of Greece) endeavoured, with the strong support of Viscount Grey, to renew the Balkan bloc on the basis of mutual concessions to B. To this proposal, Rumania and Serbia were agreeable. Furthermore, acting on the assumption that the territory variously styled Serbian or Central Macedonia was the prin. demand of B., the Entente in the celebrated note of Aug. 4, 1915, conceded Serbian Macedonia, E. Macedonia or Kavalla (at the expense of Greece), and the whole of Turkish Thrace to the Enos-Midia line. Against this offer the Central Empires could do no more than offer some of the above terms, contingently upon conquering them. Bulgarian claims were admittedly more than satisfied. Yet, for reasons which have been sufficiently indicated above, the offers were refused and the bribe failed of its purpose. The Bulgarian diplomats were merely bluffing to give the Austro-Ger. forces time to launch their great attack on Serbia. The mobilisation of the Bulgarian Army in the early autumn of 1915 in the alleged interests of 'friendly neutrality,' coupled with the presence in this army of large numbers of Ger. officers, caused the Russian Gov. on Oct. 3, in concert with the other Entente powers, to send an ultimatum to B. This led to war within three days. On Oct. 7 Austro-Ger. troops invaded Serbia and four days later the Bulgarian armies under the direction of Ger. officers crossed the Serbian frontier from the E. Shortly afterwards a secret Germano-Bulgarian treaty was revealed, by which R., as the

price of her aid in siding with the Central Empires, was promised Albania together with Gk. and Serbian Macedonia. On Oct. 15, 1915, Great Britain sent a note to the Bulgarian Gov. to the effect that a state of war existed between the two countries. On Oct. 22, 1915, the Bulgarians captured Uskub. The Serbian army fled before the combined Austro-Ger.-Bulgar drive into Albania with the loss of its artillery and transport. Thereafter all was quiescent for many months, the Allies, operating from Salonika, hesitating to move forward for fear of treachery on the part of Constantine, king of Greece. It was not till late in Aug. 1916 that the campaign was renewed, when the Bulgarians moved on Kavalla. The probability of further success against the Allies was for a time averted by Rumania's entry; but by the end of Nov. 1916 the Rumanian army was practically *hors de combat*, though in the interim and in spite of Constantine's continued treachery, Gen. Sarrail, commanding the Allies, had advanced on and captured Monastir. The Bulgarian army had by now shot its bolt so far as any further marked successes were concerned. With the abdication of King Constantine, the Allies contented themselves with more raiding and patrolling operations. Meanwhile M. Venizelos was organising a Gk. army and the Serbs were reconstituting their forces at Corfu. In Sept. 1918 the Balkan front once again blazed into activity, and in a few weeks the Bulgarian Army, defeated and outclassed, was in headlong retreat. (See under MACEDONIAN OFFENSIVE.) On Sept. 30, 1918, the Bulgarian envoys came to Salonika and signed an armistice with Gen. Franchet d'Esperey (g.v.), commander-in-chief of the army of the Orient. The most important effects of this unconditional surrender were that the direct Ger. route to Constantinople fell under allied control; the Lower Danube ceased to be available for enemy traffic, while Germany and Austria-Hungary found themselves unable to reinforce or supply Turkey except through Black Sea ports.

By the treaty of Neuilly, 1919, B. ceded to Greece her Thracian ters., thus losing her access to the Aegean Sea; though an economic outlet to it was provided by the treaty, the exact terms remain a subject of dispute. To Rumania, B. lost S. Dobruja, her richest wheat-growing land, and she also lost a strip of ter. to Yugoslavia. In 1920 an Agrarian gov. came into power, under Stambolisky, who, though not nominally a Communist, allied himself secretly with the Communist party in his own country and the Bolshevik Gov. of Russia. In June 1923 a *coup d'état* overthrew the gov., Stambolisky being killed and other Agrarian ministers imprisoned. During the Tsankov Gov. which then followed, there was much unrest and disturbance. In Sept. 1923 a plot was discovered which led to the arrest of 1000 Communists, and sev. thousands of persons were killed in local outbreaks; during 1924, about 200 assassinations took place in the following year an attempt

was made upon the life of King Boris (g.v.), and 120 people were killed and over 300 injured when a bomb exploded in Sofia cathedral. The necessarily repressive Tsankov Gov. remained in power until Jan. 1926, when it was succeeded by a democratic gov. under Liapchev. B. then pursued a policy of making treaties with the Little Entente countries, conditional on the satisfaction of her territorial and economic claims, with the result that she became isolated from the Balkan countries. Boris desired better relations with his Balkan neighbours, but would not agree to part with B.'s territorial claims. His internal policy, too, did not please the army, with which, indeed, he was never on good terms; and in 1934 a military *coup d'état* overthrew the gov. of Agrarians and Democrats, and the king was now forced to agree to the formation of what was in effect a semi-military dictatorship to offset the political and moral deterioration of his country. The new gov. turned upon the Macedonians, whom the army soon reduced to obedience or expelled. The gov. was so hostile to Boris that he was in danger of deposition, but his diplomacy and popularity with the peasantry, in conjunction with the dissensions in the army, saved his throne, and ultimately the militarist combination fell to pieces. In 1938 the king won a diplomatic success by securing the release of B. from the punitive clauses of the treaty of Neuilly; but by that time European peace was threatened, and Boris decided to sound the possibility of bringing B. into the orbit of the W. powers; but he mismanaged the undertaking and, moreover, the outbreak of war found B. with next to no market for its produce save Germany; the army was entirely dependent on Ger. weapons; Ger. intrigue was rife and the general staff was largely pro-Ger. Though the army was not used against Russia and diplomatic relations were retained with the U.S.S.R., B. joined in the signing of the second anti-Comintern Pact; Bulgarian troops and Macedonian bandits oppressed Gks. and Yugoslavs; and the king declared war on Great Britain and the U.S.A. to please his Ger. patrons. Ger. troops entered the country in March 1941 and occupied Black Sea ports, though B. was not officially at war with Russia. In 1943 the king d. suddenly in his palace in Sofia, after a mysterious illness, and was succeeded by his infant son, Prince Simeon. Reports that Boris had died from violence persisted in neutral quarters. B. had lost a ruler who was strong enough to unite politicians and generals who ordinarily did not readily co-operate. On August 28, 1944, the gov. declared B. to be neutral in the Russo-Ger. war, and Bulgarian delegates to Cairo tried to secure eleven-hour terms of peace from Great Britain and the U.S.A. Russia, however, refused to recognise the so-called neutrality of B. and called upon B. to declare war against Germany, and when no satisfactory reply was received by Sept. 5, Russia declared war on B. B. could only

sue for an armistice, and on Sept 7 its gov. declared war on Germany. Hostilities with Russia ceased a few days later. An armistice with the United Nations was signed in Moscow on Oct. 28. Russian troops occupied the country throughout 1945 and were still in B. in 1946, though it was agreed by the allied foreign ministers in Paris that Russian troops should evacuate the country within three months after a treaty was signed with B.

Sept. 9, 1946, second anniversary of the Bulgarian revolution, by which the Fatherland Front seized power, was marked by the proclamation of a People's Republic, for which the plebiscite of the previous day had given a large majority. The young King Simeon was forced to abdicate. The Fatherland Front was formed during the war by the Communist, Agrarian, Socialist, and Zveno (professional and army class) parties. It provided the political leadership of the Partisan movement, and brought the Bulgarian Army into the war on the allied side. The Partisans fought throughout spring and summer of 1944 against the forces on the pro-Ger. side, and if they achieved little at least they did not lack courage. The army fought efficiently in Yugoslavia and Hungary for the last seven months of the war. By late 1946, after the secession of the Agrarian party and the split in the Socialist party of 1945, Communist control was almost as complete in Bulgaria as in Yugoslavia. The police, now called militia, were controlled by the Communist-led Ministry of the Interior. A decree of 1946 created a 'frontier militia,' also under the Ministry of the Interior, to which men were transferred from the army. The secret police of B. is the state security section of the militia, whose members do not wear uniform. It includes men who received special training in Russia. The increased tempo in the direction of Communist control was probably explained partly by the departure of the Red Army anticipated in the peace treaty. The Soviet Gov. doubtless felt that the presence of its own forces was no longer needed, since its Bulgarian friends were now so firmly in power. A general election was held on Oct. 27, 1946. The Fatherland Front obtained 364 seats (277 of which went to the Communists) and the opposition 101. In Aug. 1947 the oppositional Agrarian Union was dissolved and its leader, Nicola Petkov, was hanged on Sept. 23 on a trumped-up charge of treason. The peace treaty was signed in Paris on Feb. 10, 1947. On Aug. 1, 1947, a treaty of friendship, collaboration, and mutual assistance was signed with Yugoslavia, and a similar treaty with Rumania on Jan. 16, 1948.

Language and Literature.—The original Bulgarian tongue was Ural-Altaic, but it has left only few traces in the Slavonic speech adopted by Bulgars who settled in the Balkan Peninsula. The Bulgarian-Slavonic tongue is closely allied to the Russian, but some Serbian, Gk., Rumanic, Albanian, and Turkish elements have found their way into the language. As

in most peasant nations, the legends of B. are many and widely told; as in most Slavonic nations, there is in the literature an atmosphere of sadness. The literature in the old days of B.'s glory consisted chiefly of translations from Gk. and theological works. From 1782 until B.'s liberation in 1878, the literature consisted chiefly of eds. of a popular and political nature. Modern literature is realistic, mystic, or philosophical in tendency, and is strongly under Russian influence. Ivan Vassov, poet and novelist, who d. in 1921, is the greatest modern figure. The poems of Slaviskov, the novels of Karavelov, the historical works of Drinov and Radev, the dramatic works of Yavorov, Raynov, and Thodorov also deserve mention. There is also a rich lyrical popular poetry. The Cyrillic alphabet is that in general use, as in Russian, viz. that modified from the Gk. by Cyril.

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Bulgarian Milk, milk containing lactic acid. Sour milk has long been looked upon as a healing agent, and the hastening of the souring process by introducing a portion in which the bacteria have already been at work is an idea borrowed from the Bulgarians and Tatars. The bacteria help in the formation of lactic acid, which acts as a preservative, preventing further decomposition. It is suggested that when sour milk is taken as food, the bacteria multiply in the intestines and aid digestion by preventing harmful fermentation.

Bulgarin, Tadel Venediktovitch (1789-1859), Russian writer, b. in Lithuania, of Polish ancestry; served against France, and later in Napoleon's Polish army; settled in St. Petersburg about 1820. In 1823 he founded the *Northern Archive*, and in 1825 a new ed. of the *Northern Bee*, where his bitter and sarcastic writing attracted much attention. He was a follower of the Absolutist party, and was intimate with the secret police. His novels include *Ivan Vishigin, or the Russian Gil Blas* (1829, Eng. translation, 1831); *Peter Ivanovitch Vishigin* (1830); *Mazepa* (1832); and he also pub. *An Historical, Geographical, and Literary Survey of Russia* (1837).

Bulmus is the name of a large genus of land-snails comprising over 1000 species. They have external shells, and are related to the hedge- and grass-snails.

Bulimia, Boulimia, or Bulimy, insatiable hunger (Gk. *βουλμία*, from *βους*, ox, *λιμός*, hunger), state of ill health due to various causes. The patient has a constant morbid craving for food.

Bulkheads: 1. The partitions which divide up the internal spaces of a ship. They are generally transverse and water-tight, but they may be longitudinal and partially or completely non-water-tight, as the circumstances may require. In warships particularly the transverse water-tight B. are very numerous, to check the entrance of water through damage while in action, and, as a rule, each bulkhead is fitted with an hydraulically worked door which closes automatically when the compartment is flooded. The subdivisions required by Lloyd's Register for all steamers are four, i.e. one bulkhead at each end of the machinery spaces and one at a reasonable distance from each end of the ship. For larger steamers other B. have to be fitted according to their size. The bulkhead nearest the bows is called the collision bulkhead and that nearest the stern the after-peak bulkhead. In sailing ships the collision bulkhead only is required. 2. The sea-walls which mark the line of the shore and from which the piers and quays project. 3. A general term for a partition in mines and tunnels, etc., sometimes solid and sometimes provided with a door for passage of men and materials.

Bulkley, Lucius Duncan (1845-1928), Amer. dermatologist, educated at Yale and later studied medicine in Europe. Took a leading part in the foundation of the New York Skin and Cancer Hospital, where he acted as consulting physician and later held similar positions in New York Hospital and other important institutions. Publications: *Eczema and its Management* (1881); *Manual of Diseases of the Skin* (1898); *Compendium of Diseases of the Skin* (1912); *Cancer, its Causes and Treatment* (1915-17); *The Medical Treatment of Cancer* (1919); *Cancer and its Non-surgical Treatment* (1921); *Cancer of the Breast* (1925).

Bull, see Ox.

Bull, papal instrument, ordinance, letter, or decree, issued by the Apostolic Chancery, and differing from briefs down to 1878 in being written in Gothic script. At that date Pope Leo XIII. ordered the use of Lat. script, and restricted the use of the very ant. leaden seal to important Bs., replacing it in other cases by a red one. Bs. are written on parchment, to which the seal is attached by a yellow or red silk cord when concerned with the granting of favours, but by a grey one when dealing with the administration of justice. The name comes from the Lat. *bulia*, meaning the capsule of wax surrounding a seal; the term being extended to the seal itself, and then to the document. All Bs. begin with the name of the pope, followed by *Servus servorum Dei*. Among the most famous Bs. of hist. are *Clericis Laicos*, 1296, and *Unam Sanctam*, 1302, issued by Boniface VIII. against Philip le Bel of France, both dealing with

the taxation of church property (see under CLERICUS LAICOS); *In Cena Domini*, 1362, issued against heretics by Urban V.; *Execrabilis*, 1460, in which Pius II. declared the papal superiority over the councils; *Etsurge Domine*, 1520, issued by Leo X. against Luther and burned by him; *Unigenitus*, 1713, which condemned Quesnel; *Dominus ac Redemptor Noster*, 1773, issued by Clement XIV. to abolish the Jesuits; *Ecclesia Christi*, 1801, which estab. the Concordat with France; *Sollicitudo Omnium*, 1814, by which Pius VII. restored the Jesuits; *Ineffabilis*, 1854, proclaiming the doctrine of the Immaculate Conception, and *Pastor Aeternus*, 1870, in which Pius IX. proclaimed papal infallibility.

Bull, amusing and unintentional blunder in speech, due to the conjunction of incompatible ideas, and implying an evident contradiction in terms. Bs. are usually associated with Ireland, and many of the best examples are Irish. One of the most famous is that made by a speaker during the Farnell Commission, himself a soldier who had run away during action, who stated that it was better to be a coward for a few hours than to be dead all the rest of your life.' See R. L. Edgeworth, *Essay on Irish Bulls*, 1802 (new ed., 1898).

Bull, George (1634-1710), learned Eng. churchman, educated at Tiverton School and Exeter College; would not take the oath of allegiance to the Commonwealth, and was privately ordained, in 1655, by Bishop Skinner, who thereby committed a capital offence. As minister of St. George's, near Bristol, he followed the liturgy under the cloak of extemporary devotion. His *Harmonica Apostolica* (1659), written in Lat., served to minimise the divergence in the views of St. Paul and St. James on justification, but the work which estab. his high reputation was entitled *Defensio Fidei Nicenæ*, 1655.

Bull, John, popular term for the typical Englishman. It took its rise from Arbutnot's *History of John Bull* (1712) (in which the Church of England figures as his mother), a political skit satirising the duke of Marlborough, and stirring up public feeling against France. J. B. begins to figure frequently in broadsides and caricatures about the time of the Fr. Revolution. The idea has since evolved in *Punch* and other humorous papers.

Bull, John (1563-1628), Eng. musical composer, b. in Somersetshire; became organist of Hereford Cathedral in 1582, and in 1585 was admitted to the Chapel Royal. He was the first prof. of music at Gresham College, and one of the musicians of Prince Henry. He left England in 1613, and d. in Antwerp. *God save the King* has been attributed to him.

Bull, Ole Borneman (1810-80), Norwegian violinist, b. at Bergen, and was largely self-taught. In 1828 he appeared at a concert, and was so successful that in 1829 he went to Cassel to study under Spohr. He soon returned to Bergen, but in 1832 made his true début in Paris. Here he heard Paganini, and adopted his

style of playing. He performed with great success all over the Continent till 1839, when he went into retirement for a few years. In 1843 he went to America, which he frequently revisited. His technique was brilliant and he showed to best advantage in the national fantasias of his own composition.

Bulla, term applied by the Romans, to any ornamental stud or boss, but particularly to an amulet worn round the neck by children of noble birth till they attained maturity. The custom was of Etruscan origin, and after the second Punic war was extended to all children of free birth.

Bulla, or **Bubble-shell**, is a genus of gastropod molluscs of the order Euthyneura. The species inhabit muddy and sandy sea-water and feed on animal matter. The shell is external, has no projecting spire, and is so thin that it resembles a bubble. *B. solitaria* is an Amer. species.

Bullace, or *Prunus insititia*, is a species of Rosaceae which is nearly related to the sloe and plum. The fruit is globose, and the plant is a native of Britain.

Bullae, collections of serum raising the outer skin from the true skin. They may be due to injury or friction as in rowing, or be symptomatic of skin affections, as pemphigus and hydroa.

Bullant, Jean (c. 1515-78), Fr. architect and sculptor, developed his taste and acquired his knowledge by a faithful study of the classical monuments and statues in Italy. This may be gathered from his later treatise entitled *Regle generale d'architecture des cinq manieres* (1568), the earlier being a description of the various methods of making sundials, which he called *Recueil d'horlogiographie* (1561). His *Château d'Anouen*, begun about 1540, is universally recognised as one of the finest architectural achievements of the period, and is remarkable, above all, for the purity of his style. For Catherine de' Medici, who early appreciated his talent, he built the Hôtel de Soissons, which stood on the site now occupied by the Bourse de Commerce. The Hôtel Carnavalet, the central buildings of the Tuilleries, and the tomb of Henry II. and his patroness, Catherine, are also his work.

Bullard, Robert Lee, distinguished Amer. general, b. at Youngstown, Alabama, Jan. 15, 1861. Trained for the army at W. Point Academy, he served in the Sp.-Amer. war and the campaign in the Philippines. He had risen to the rank of colonel when America entered the First World War. He landed in France as the commander of a brigade in the first div. of the Amer. expeditionary force in 1917. Later in this year and in 1918 he commanded in turn the First and Second Amer. Armies, taking a prominent part in the second battle of the Marne in July 1918. He retired in 1925 from the army. *Pub. Personalities and Reminiscences of the World War* (1925).

Bullas, in Spain, site on hill in prov. of Murcia; interesting Rom. remains; manufs. hempen fabrics, earthenware, and brandy.

Bull-baiting, formerly a popular sport in England. A bull, with the points of its horns protected, was fastened to a stake and attacked by bulldogs. The sport was abolished by law in 1835.

Bulldog, breed of dog, employed for the baiting of bulls (abolished by law in 1835). It is probably a sub-variety of the mastiff, crossed with lesser breeds, and the tales concerning its descent from the hyena may be dismissed as so much fiction. In Elizabethan times these dogs were perhaps the most sought-after Eng. breed, because of the prevalence of the sports of bull- and bear-baiting. Their ability to seize and cling to the muzzles of the animals they baited became proverbial, and was only due in part to their innate courage, as popularly conceived, the nature of the 'underbite' or locked jaw



BRITISH BULLDOG

peculiar to the breed making it difficult for the animal to lose its hold when once securely fixed. There is some evidence that the B. was known in Rom. Britain. During the eighteenth and early nineteenth centuries the breed was in high favour because of its fighting propensities. But the modern B. evinces anything but a pugilistic character, and, as every breeder knows, is notorious for its good nature, especially with children, who are much safer with it than with the more 'snappy' breeds. The breed is not long-lived, a B. of six years being considered advanced in years, and few live much beyond that age. As a watchdog the B. is useless. The points of the modern B. are as follow: colour, white (the standard colour), brindle, fawn, brown, *not* black, which is disallowed; skull of massive proportions, deep 'stop' between the eyes, which should be placed well apart; nose black, if spotted with pink it is known as a 'dudley nose', and tends towards disqualification; ears 'rose' or 'tulip', neatly set and light; neck thick and short; chest well developed, legs massive, showing plenty of bone, and short, so set as to give the dog the appearance of being 'cloddy' or set near the ground; body short, tapering near the short ribs, and neatly proportioned; back shaped 'like that of a roach'; tail very short, and never carried high. The dog must be 'short-faced,' and the nose well

set back—the further the better—between the eyes, and the teeth, upper and under, should be well displayed. Weight from 20 to 65 lb.

Toy Bulldogs have of recent years achieved considerable popularity as a breed, especially in France. They possess few of the characteristics of the heavier breed, with faces less 'set back,' and heavy bat-ears.

The *Dogue de Bordeaux* is a species of B. employed as a bull-baiter in the bull rings in the S. of France. It has the appearance of a cross between a B. and a mastiff, and is steadily growing in popularity among breeders in this country.



FRENCH BULLDOG

When crossed with other breeds, especially with the mastiff, the B. tends to become vicious and even dangerous, and this cross is much in demand among night-watchmen and persons who have the charge of premises during the night.

Bulldog, German, see BOXER.

Bulldog, or Bull-dog, refractory material composed of ferric oxide and silica, made by roasting ferrous silicate (tap cinder) in air. It is used for lining the hearths of puddling furnaces.

Bulleo, Frank Thomas (1857-1915). Eng. author, b. at Paddington; left school in 1866 to become an errand boy. Led an adventurous life. Went to sea in 1869, and made many voyages, becoming chief mate at one time. Left the sea in 1883, and entered the Meteorological Office, where he remained till 1899. Amongst his many works may be mentioned *The Cruise of the 'Cachalot'; Idylls of the Sea; The Log of a Sea-Waif; With Christ at Sea; The Apostles of the South Sea; Deep Sea Plunderings; A Whaleman's Wife; Creatures of the Sea.*

Buller, Sir Redvers Henry (1839-1908). Eng. general, b. near Crediton, Devonshire. In 1860 he served in China; in 1870 in the Red R. expedition; in 1874 in the Ashantee war; and in 1878-79 in the Kafir and Zulu campaigns. In these

last he specially distinguished himself, and won the V.C. for the rescue of three comrades. In 1881 he served in the Boer war as chief of the staff to Sir Evelyn Wood; in 1882 in the Egyptian campaign as head of the Intelligence dept., and in 1884-85 as chief of staff in the Sudan war, receiving the K.C.B. in 1885. He became a quartermaster-general in 1887, and also under-secretary for Ireland, in 1890 was promoted to adjutant-general, in 1891 to lieutenant-general, and in 1894 received the G.C.B. In 1898 he obtained the command of the First Army Corps and the Aldershot garrison, and in 1899 became commanding general of the Brit. forces in S. Africa, and later general officer commanding in Natal. Owing to severe reverses round Ladysmith he was superseded by Lord Roberts, and after engaging in the expulsion of the Boers from Natal, returned to England in 1900. He was again commander of the First Army Corps at Aldershot, but was retired in Oct. 1901 in consequence of an imprudent speech. Sev. unfortunate facts concerning his S. African leadership became public, and he left the army in 1906. See C. M. Melville, *The Life of Sir Redvers Buller*, 1924.

Buller, Sir Walter Lawry (1838-1906). New Zealand ornithologist and jurist, whose contributions to science form one of the chief factors in his career, was b. in New Zealand, and was educated at Wesley College, Auckland. Took a prominent place in the affairs of the Maoris, appointed gov. interpreter at Wellington in 1855. Created magistrate in 1862; came to England in 1871; called to the Bar in 1874. Received titles of F.R.S., C.M.G., K.C.M.G., and Sc.D. of Cambridge.

Bullet, solid projectile discharged from small-arms of all kinds, in contradistinction to the larger missiles used by the artillery. In the old smooth-bore muskets, accuracy of aim was spoiled by various difficulties, such as the pressure of the gas generated by the discharge, and the fact that the projectile must always be smaller in diameter than the bore of the gun. This early caused the invention of the system of rifling the bore, and hence came a revolution, also, in the form of the B. The smooth-bore musket had fired a heavy spherical lead shot. In William IV.'s reign the Brunswick percussion rifle was introduced into the Brit. Army, and for a while the old form of B., slightly enlarged, was retained. It was, however, 'belted,' that is to say, it had a projecting ring round it which fitted into the grooves in the barrel. In 1836, Greener, an Eng. gunmaker, produced an expanding B., for which, twenty-one years later, he received a reward of £1000 from the gov. The ball was oval in shape, fitted with a plug which the force of the discharge drove into the lead of the B. The lead was thus forced to expand and fill the grooves. The result of this expansion is to prevent windage, and to communicate a twist to the B. which enables it to travel steadily. Greener's invention was never made practical use of, as the gov. objected to its complication. Meanwhile, in France,

Capt. Delvigne had also perfected a new form of rifle, with a similar kind of B., and this was introduced into the Fr. Army. About 1849 a further step was made by Capt. Minié, a Frenchman, who invented a cylindro-conoidal (in the earlier patterns only conoidal) B. The plug was discarded in favour of a hemispherical iron cap, which served the same purpose. In 1851, the Minié rifle was introduced into the Brit. Army. The introduction in the Minié rifle of an elongated B. made the use of the muzzle-loading rifle somewhat more easy, but the breech-loading rifle was soon in use. Most difficulties had now been overcome. The boring gave the B. the twist necessary to enable it to keep its course, the expansion enabled it to grip the bore properly so that B. and bore had one axis. The use of the cylindrical B. now made it possible to diminish the size of the bore, while retaining a heavy B. Thus came the introduction of small-bore rifles, where the B. was made longer still. It was, of course, essential that the weight of the B. should not be diminished too much. A result of this lengthening was that rifles were made with a greater twist in the grooving. The B., to be of use, has to travel point foremost. It is kept in position by the rotation communicated to it from the bar,[†] and so any lengthening of the B. causes it to require greater rotation to keep it from drooping or deflecting. Further, to prevent deflection, some early Bs. were furnished with circular grooves. If they turned at all, the wind caught in these and returned them to their original direction. The Bs. for large-bore rifles had been formed of lead, slightly hardened, but this would be rendered soft and shapeless by too rapid a rotation. Hence, the small-bore B. is generally covered with some harder metal. No expansion of this can take place, and so the B. is made slightly larger in diameter than the bore it will pass through. The dum-dum, or expanding B., has the lead exposed at the end, and so expands when it strikes. Its use is now forbidden in civilised warfare. Most modern Bs. are of composite form, consisting of a cupro-nickel or coated steel envelope containing various types of filling. Filling usually consists of lead, but frequently an aluminium or a fibre tip is placed inside the nose of the B. to improve its ballistic properties. Armour-piercing Bs. contain a lead sleeve and a pointed tool steel centre giving much greater penetrating power than ordinary Bs. In tracer Bs. the rear portion of the filling consists of a burning composition which is ignited by the flash of the charge and leaves a visible wake for the greater part of its flight. Explosive Bs. were introduced by the Austrians during the First World War as range indicators; incendiary Bs. were developed for use against aircraft. For military purposes B. calibres range from 0.256 in. up to 1 in., beyond which size the term B. ceases to be applicable. During recent years attempts have been made to increase the ranging properties of Bs. by streamlining the bases. Ranges up to

5700 yds. have been thus obtained. Bs. for revolvers are in some cases of the solid lead type, but for the higher-velocity automatic arms it is necessary to use the harder enveloped type.

Bulletin, Fr. word which has been imported into the Eng. language, signifying a short authentic account of some passing event, intended for the information of the public. B. is derived from Lat. *bulleta*, a seal. When kings and other persons of high rank are dangerously ill, daily Bs. are issued by the physicians relative to the state of the patient. The B. des Lois is the Fr. statute book.

Bull-fight. Combats of men with bulls have for long been a favourite national sport with certain of the Lat. races. They appear to have been common in Greece and Rome, and still exist in Portugal, France, Mexico, and especially in Spain, where they were abolished by Charles IV., but reintroduced by Joseph Bonaparte. Up to the Sp. Civil war (1936-39) Bs. were held in all the large towns of Spain, particularly in Madrid, either for personal profit or for charitable objects. But since the war the sport has waned. The bulls are bred in Castile and Andalusia, the former being preferred. The most famous fights were held in the Plaza de Toros at Madrid, a kind of open-air circus, surrounded by tiers of seats and boxes, and capable of accommodating 10,000 to 12,000 people. The typical B. begins with a processional entry of the combatants, in which the matadors lead, being followed by the banderilleros, the picadors, and lastly the *monos sabios*, or attendants with spare horses. After saluting the mayor, the picadors, dressed in a picturesque national costume, armed with lances, and mounted on worn-out horses, take up their position in the centre of the arena. A bull is then led out, and the picadors attack it with their lances. The horses are urged on by attendants with sticks, who are dressed in blue and red, and when a horse is either wounded or throws its rider, the banderilleros attract the attention of the bull by waving their red and yellow capes while the picador makes his escape. The banderilleros save themselves by leaping over the barricades. After the picadors have fought for some time, they leave the ring and are succeeded by the banderilleros, who infuriate the bull by means of banderillas. These are gaily coloured and ornamented barbed darts, about 2 ft. long, sometimes having fire-crackers attached to them which the men stick into the animal's neck. Finally a matador, bearing a naked sword and a *muleta*, or vermilion flag, enters and salutes the mayor. He lures the bull by means of the red cloth, and as it blindly rushes at him, steps aside and stabs it between the left shoulder and the blade, usually killing it in a short time by means of this or some other stroke. As soon as the bull is dead, the performance recommences with a fresh animal, and should the matador, as occasionally happens, be fatally gored by the bull, another matador takes his place. Eight or ten bulls are often killed in one

day, and the slaughter of horses is very large and involves revolting cruelty. Successful matadors achieve immense popularity and are able to retire with large fortunes. The two most famous have been Rafael Guerra, or Guerrita, and Manuel Esparto. Bs., in the milder form of bull-baiting, have in recent years been introduced into S. France, but the worst abuses are avoided.

Bullfinch, *Pyrrhula europæa*, is a passeriform bird of the family Fringillidae, and differs from other finches in the thickness of its head and neck. It is small, bluish-grey or black, red or chocolate-breasted according to sex, and is a native of woods. It is a favourite cage bird, and in captivity it can be taught in the moulting season to whistle tunes (the ordinary species known as the piping finch).

Bullfrog, *Rana catesbiana*, a species of Ranidae, is a N. Amer. frog which utters a bellowing noise, and thus obtains its name. It is aquatic, green in colour, and reaches a length of 7 in.

Bullhead, or **Miller's Thumb**, is the popular name of *Cottus gobio*, the typical genus of the Cottidae. The species are usually found near sea-coasts in the pools, but may also occur in fresh water. They are ugly, spinous fishes, with broad, depressed heads, and are of no value as food. *C. scorpius* and *C. bubalis* are common marine species in Europe and are numerous in rock pools. In America the name B. is given to members of the catfish family, or Siluridae.

Bulli, tn. of New S. Wales, Australia, 60 m. by rail S. of Sydney. Centre of a colliery dist. On the B. Pass is Weber's Lookout, a holiday resort.

Bulliard, Pierre (c. 1742-93), botanist, used to design and engrave his own illustrations, and was the first to print plants in colour. Among his works may be cited *Flore parisienne* (1774); *Herbier de la France* (1780-93), besides a botanical dictionary (1783), and treatises on poisonous plants (1784) and mushrooms (1792).

Bullinger, Heinrich (1504-75), Swiss reformer and Protestant theologian, was b. at Bremgarten, the son of a priest, who himself later embraced the reformed faith. During his studies at Cologne he gained a first-hand knowledge of the Bible and an acquaintance with Luther's works. He studied for a time under Zwingli, whom in 1528 he accompanied to the Berne Conference. In 1529 he married an ex-nun, and was made pastor at Bremgarten, which city he gained to the Reformers. On the death of Zwingli at Cappel in 1531, he left Bremgarten and took refuge at Zürich, where he became chief pastor and champion of the Protestants.

Bullion, term denoting the precious metals of gold and silver in their refined condition, before they are coined or otherwise manufactured. Though this is the true sense of the word, it is often extended, in speaking of exportation, to include the coined metal also. The values of B. as a means of exchange are too numerous to mention, as barter is a process which must necessarily die out at the beginning of civilisation. Gold and silver

are the same in quality throughout the world; they do not deteriorate greatly with age or use; they are not so rare that the coins have to be made inconveniently small; they are capable of easily receiving and retaining an impress. Since gold and silver are so universally used as a medium of commerce, it has of course been necessary to arrange that in all civilised nations the B. should be made with a standard quantity of precious metal in proportion to its alloy. In earlier times this was not so, and in the Middle Ages it will be remembered how commerce was frequently injured by the debasing of the coinage. Though even now matters are not so arranged that equal quantities of the B. of various countries are exactly equal in value, yet the difference is so small as to be inconsiderable.

Bull Mastiff, see MASTIFF.

Bull Moose, name of a third party founded in 1912 by the friends of former president, Theodore Roosevelt, and which gave occasion to one of the most famous presidential campaigns in the hist. of the U.S.A. In 1908, when the presidential term of Roosevelt was expiring, he brought about the nomination of W. H. Taft (q.v.) by the Republican convention. But shortly after Taft entered the White House, a notable coolness sprang up between the two men, because Roosevelt thought Taft had gone back on progressive principles. When the Republican convention of 1912 met in Chicago, Roosevelt entered the lists against Taft for renomination, his friends putting him forward for a third term. But Taft and the old-line politicians had a firm grip on the convention. As soon as this became apparent, the Roosevelt followers left the convention and set up a 'rump' convention of their own. Roosevelt was promptly nominated for the presidency. One day while attending the Republican convention Roosevelt was asked how he felt. He replied, 'Like a bull moose.' The metaphor was at once seized upon by newspaper cartoonists and political orators, and the new party was promptly christened the 'Bull Moose' party. The nominees of the party were placed on the ballot under the emblem of the bull moose, just as in most states the Democratic candidates are listed under the rooster and the Republicans under the Amer. eagle. The net result of the Bull Moose ticket was to split the Republican party completely. Woodrow Wilson won by the greatest majority known in modern times. Taft was likewise the most heavily defeated man. The Bull Moosers, as they were popularly known, had declared their intention of forming a permanent progressive third party, and expectation was keen as to what would happen in 1916. But the political genius of the Amer. people is against more than two major parties, and Roosevelt himself destroyed the chances of his new party when he declined to stand again.

Bullock, Shan F. (1865-1935): Irish novelist. His first success was *Robert Thorne*, a mirror of the life of the average London clerk, which was pub. 1907.

Other novels were *The Awkward Squads* (1893), *The Squireen* (1903), and *Hetty* (1911). He also wrote a biography of Thomas Andrews, designer of the *Titanic*, and a vol. of poems, *Mors et Vita*, which appeared in 1912 and 1923 respectively.

Bullock's Heart, see CUSTARD-APPLE.

Bulldroarer, Whizzer, Whizzing Stick, or **Lightning Stick**, instrument employed by savage people usually for the purpose of causing rain. It consists of a rectangular slat of wood from about 6 in. to 2 ft. long, and $\frac{1}{2}$ in. to 2 in. wide, suspended by one end to a cord, the latter



John H. Stone

BULL-TERRIER

often being provided with a wooden handle. It is whirled rapidly about the head, and the noise of the air against the slat produces a roaring or whizzing sound. Among some Australian tribes it is thought to be employed for the purpose of frightening the women away from tribal councils or religious orgies, the females being told that it is the voice of the presiding god or demon. But in N. America it is, or was, used as an instrument of sympathetic magic, its noise being supposed to represent that of the wind which accompanies rain, and it is employed to induce by mimicry the actual wind itself.

Bull Run River, small riv. in Virginia, U.S.A., which has given its name to two battles fought in the neighbourhood during the Civil war: (1) July 21, 1861, when the N. troops, under M'Dowell, were utterly defeated by the Confederates under Beauregard. (2) Aug. 28, 1862, when the Union forces under Pope, who was attempting to guard the Potomac

line, were crushed by the Confederate forces under Lee, reinforced by Jackson.

Bulls and Bears. In the slang of the Stock Exchange 'Bulls' are men who have nominally bought stock, but with no intention of paying, hoping to sell again at a profit before long. 'Bears,' on the contrary, are men who have sold stock which they do not possess, hoping that a fall in prices will enable them to buy at a profit.

Bull-terrier, cross-breed of bulldog and terrier. The B. is a very strong, plucky dog, and a fearless fighter, with infinite determination. It is somewhat ferocious as a house-dog, but is gentle and affectionate to its owner. It has short, smooth hair, which should preferably be white in a good breed, but may be reddish, brown, or fawn. It weighs from 20 to 50 lb., but some toy varieties have been produced which weigh as little as 7 lb. The tail is left uncropped, and should be carried in a straight line with the back; the front legs firm and straight, and the jaw strong. White Bs. are permitted black markings on the nose, ear, and eye.

Bull, The, see TAURUS.

Bull's Eye (star), see ALDEBARAN.

Bull Trout is a term applied to various species of *Salmo*, which are natives of N. Europe, and belong to the Salmonidae, or family of trout salmon, and char. The name is frequently applied to *S. erior* and *S. cambricus*, also known as the grey trout. *S. trutta* possesses this name as well as those of sea trout, salmon trout, sewin, and phinok.

Bully Tree, name given to certain trees, especially those possessing a milky juice, such as the balata and chickie gum trees. They belong to the genera *Mimusops*, *Lucuma*, *Bumelia*, etc., all of which furnish trees of considerable utility. See BALATA, GUM, etc.

Bulmer, William (1757-1830), printer of the eighteenth century, celebrated for his production of the *Boydell Shakespeare*, which consists of nine vols. folio, with a vol. of engravings called *The Shakespeare Gallery*, 1791-1805. Bewick, an intimate friend of B., engraved some of the illustrations for the vols. B. also printed other costly eds., such as Milton (1793-97, 3 vols, folio), and Goldsmith (1796, 4to), for which latter ed. Bewick also provided illustrations.

Bülow, Bernhard Heinrich Martin Karl, Prince von (1849-1929), Ger. statesman, was b. at Klein-Flottbeck, Holstein—then Dan.; educated at Frankfurt-on-the-Main and other schools; went to the univs. of Lausanne, Leipzig, and Berlin. Joined the Prussian regiment of Royal Hussars and did military service as lieutenant in the campaign of 1870. Entered the diplomatic service and served in St. Petersburg, Vienna, Paris, and Bucharest (1873-88); ambassador at Rome, 1893. He was then appointed Prussian minister of state, and finally received the appointment of Ger. imperial chancellor in 1900. He was made prince in 1905. The Reichstag having rejected his budget, he resigned, 1809. In Dec. 1914 he was sent as ambas. to Rome. When Italy joined the Allies

in May 1915. B. finally retired. His *Memoirs*, pub. in 1930-31, contain an embittered narrative of Ger. diplomacy, political corruption, and personal jealousies (see vol. III, *The World War and the Collapse of Germany*)—lessons evidently lost on the later Nazi rulers of Germany.

Bülöw, Friedrich Wilhelm (1755-1816), count of Dennewitz and Prussian general, was b. at Falkenberg, and entered the army in 1768. He had already had fair experience of war, when in 1813 he took up arms against France. He earned great distinction at Grossbeeren, a victory gained almost entirely by his generalship, and at Dennewitz, where Napoleon's advance on Berlin was checked. In 1815 he arrived too late to share in the battle at Ligny, but he played his part in the victory at Waterloo. He d. at Königsberg.

Bülöw, Hans Guido von (1830-94), Ger. pianist and conductor, was b. at Dresden, the son of Karl Eduard B., a noted author. He studied under Wieck and Liszt, and soon decided to make music his life-study. For a time he visited Wagner to study conducting, but he soon came back to Liszt, whose daughter he married in 1857. In 1864 he became chief conductor at the Royal Opera in Munich and in 1865 director of the Conservatorium. Here he organised and produced, with exceptional talent, the works of Wagner. In 1869 his wife divorced him and married Wagner, but this did not dim his enthusiasm for that composer's work. He d. at Cairo. B. was a pianist of the very first class, and a talented conductor. His own compositions are few, but his taste and critical ability were remarkable.

Bülöw, Karl von (1846-1921), Ger. field marshal, son of a Ger. military officer. He joined 2nd Guards regiment infantry, 1864. Distinguished at Koniggratz in Austro-Prussian war, 1866. Served throughout Franco-Prussian war, 1870. Held various staff appointments; placed in command of 4th Guards regiment, 1894; major-general, 1897. Began invasion of Belgium, 1914, leading brigade of Second Army which occupied Liège Aug. 7; then marched towards the Meuse, where he was driven back. During his retreat following this disastrous reverse, and during the battle of the Aisne, he was placed in command of the First and Ninth Armies—apparently to saddle him with responsibility for the failure. In 1916, at his own request, he was retired; he d. in Berlin.

Bulrush is the name given to sev. plants which grow in marshy ground and bogs. The commonest of these are *Typha angustifolia* and *T. latifolia*, called also the reed-mace and cat's-tail, or great and lesser reed-mace respectively. The inflorescence of the B. is a spadix in which the flowers form a long cylindrical mass, the yellow male flowers above and the brown female below. The perianth is represented by long hairs, there are one to five monadelphous stamens, and the female flower has a single carpel. The fruit is an achene, covered with long hair, and is wind-distributed. These species

belong to the Typhaceae, but another B., *Scirpus lacustris*, belongs to the Cyperaceae; its stems are used for making mats, baskets, and the seats of chairs. *Pennisetum typhoides*, an Indian species of Gramineae, is the pearl millet, or B.

Bulsar, seaport of India, 115 m. N. of Bombay. It exports some timber. Pop. 14,000.

Bulthaupt, Heinrich (1849-1905), Ger. author, b. at Bremen. Was appointed librarian of the Bremen library in 1878. Wrote dramas, poems, and other works. His dramas include *Die Arbeiter* (1876); *Eine neue Welt* (1886); and *Der verlorene Sohn* (1889). He also pub. a vol. of poems called *Durch Frost und Glut*. Other works which brought him into prominence are *Dramaturgie des Schauspiels* (1884), which ran through sev. eds., *Dramaturgie der Oper*, and *Shakespeare und der Naturalismus* (1893).

Bulti, or Bultistan, the N. part of Kashmir, India, once an independent state.

Buluwayo, see BULAWAYO.

'Bulwark', Brit. battleship, one of later ships of *Formidable* class, 400 ft. long, of 15,000 tons, and 18 knots. Launched 1899. Blown up at Sheerness, Nov. 26, 1914.

Bulwer, Edward George Earle Lytton, and Edward Robert, see LYTTON.

Bulwer, Sir William Henry Lytton Earle (1801-72), Eng. diplomatist and author, elder brother of Lord Lytton. He was employed on diplomatic service at The Hague, Brussels, and Vienna, and in 1830 elected parl. representative of Wilton. He later sat for Coventry, and from 1835 to 1837 represented Marylebone, in each case in the Liberal interest. In 1837 he became attached to the Brit. embassy at Constantinople, and his successor here was such that in 1843 he was made minister plenipotentiary to the court at Madrid. Here he offended Narvaez, who secured his withdrawal on the accusation of complicity in certain plots. In 1849 he was sent to Washington, where he represented Britain in the negotiation of the Clayton-Bulwer treaty (q.v.), and in 1858 to Constantinople. In 1851 he was made G.C.B., and in 1871 he became Baron Dalling. His works include *France, Social, Literary, and Political* (1834); *Historical Characters* (1868-70); and a *Life of Viscount Palmerston* (1870).

Bulwer, John (fl. 1654), Eng. physician, was the first to write, in Eng., on the methods of imparting knowledge to the deaf and dumb. Except that he was himself a teacher of the deaf and dumb, nothing is known of his private life. *Chirologia, or the Natural Language of the Hand* (1644), *Philosophus, or the Deaf and Dumb Man's Friend* (1648), and *Pathomyologia, or a Dissection of the Significant Muscles or Affections of the Mind* (1649), are his chief works.

Bumble-bee, see HUMBLE-BEE.

Bumboat, broad, clumsy boat employed to carry provisions, etc., from land to vessels lying in port or near the shore. They were formerly managed by women. A scavenger's boat for removing ships' refuse is sometimes called a B.

Bunbury, in W. Australia, seaport and tn. in the co. of Wellington; its famous harbour Koombanah has breakwater constructed on a coral reef. Chief exports are coal, tin, timber, and agric. produce. Pop. 8,000.

Bunbury, Sir Henry Edward (1778-1860), seventh bart., son of Henry Wm. B. (q.v.). He served in the army from 1795 (when he obtained a lieutenancy) to 1829. He was under secretary of state from 1809 to 1816. He conducted an important secret mission to Wellington, and, later, was given the task of informing Napoleon that he was to be sent to St. Helena. In 1830 he became member of Parliament for Suffolk. He was the author of sev. works, of which the chief is the *Narrative of Certain Passages in the Late War with France* (1852), dealing with the Peninsular war and the period which preceded it.

Bunbury, Henry William (1750-1811), Eng. caricaturist, b. at Mildenhall, Suffolk, was the son of Sir Wm. B. He was educated at Westminster and Cambridge, and his faculty for caricature early showed itself. He never attempted political subjects, thus keeping himself on good terms with all parties, but his humorous drawings became so famous as to give him rank with his contemporaries Rowlandson and Gillray. He was never forced to trust to his talent for his livelihood. Examples of his work are 'The Country Club' and 'The Barber's Shop.'

Buncrana, mrkt. tn. and watering-place of co. Donegal, Ireland, on Lough Swilly. There is some fishery and trade in agric. produce. Pop. 2000.

Bund (dyke), see **BAND**.

Bundaberg, port of Queensland, Australia, near the mouth of the R. Burnett, 270 m. N. of Brisbane by rail. It has saw-mills, breweries, etc., and is the centre of a sugar-making dist. Pop. 11,000.

Bundelkhand, collection of nine Indian states in central India. Diamonds of good quality but small size are found in some parts.

Bundesrat. This council, together with the Reichstag, formed the federal gov. in Germany from 1871 to 1919. Its place was taken, under the Weimar Constitution, by a similar body called the Reichsrat. The B. consisted of delegates chosen by the govs. of the different states for each session, whilst the Reichstag, or popular assembly—which before the Second World War became a puppet body—contained members chosen by the people. The king of Prussia presided over both chambers under the title of Ger. emperor. The B. was the superior governing body, and could withhold measures passed by the Reichstag. Under the Nazi regime the Weimar Constitution was abolished and government was concentrated solely in the hands of Hitler, the Führer. See **CONSTITUTION, Germany**.

Bundi, native state of India, in Rajputana. The state is wild and crossed by two ranges of hills. The R. Mej drains it, and there are no railways.

Chief tn., B. Area 2250 sq. m. Pop. 187,000, tn. 19000.

Bundoran, vil. and watering-place of co. Donegal, N. Ireland, on Donagal Bay, 4 m. S.W. of Ballyshannon. Pop. 1000.

Bundy, Edgar (1862-1922), Eng. painter. Elected an associate of the Royal Academy in 1915. Subjects mainly historical, his pictures illustrative of Brit. seapower being highly popular and widely reproduced.

Bungalow (Anglo-Indian word from native *Banglā*, Bengalese), a one-storeyed house with a veranda, and a pyramidal roof, generally thatched. It is the kind of house in general use by Europeans in India. Dāk B. are gov. erections for the use of travellers in the interior of India. The name is now given in England and America to light erections for seaside and holiday use, and, loosely, indeed, to any dwelling-place of one storey only but with one or more rooms in the roof-space.

Bungay, mrkt. tn. of Suffolk on the R. Waveney. It has two par. churches of interest architecturally, and large printing works and malt trade. Pop. 3100.

Bungener, Louis Félix (1814-74), Fr. Protestant theologian, was b. at Mar-sailles, of Ger. parentage, and studied and taught theology at Geneva. He pub. sev. works written as novels, but each intended to defend some principle of Protestantism. Of these may be named: *Un Sermon sous Louis XIV.* (7th ed. 1881); *Histoire du Concile de Trente* (2nd ed. 1854); *Trois Sermons sous Louis XV.* (6th ed. 1902); *Christ et le Siècle* (1856); *Rome et la Bible* (6th ed. 1860); *Calvin, sa vie, son œuvre, et ses écrits* (2nd ed. 1863). Almost all have been trans. into Eng. and Ger.

Bunhill Fields, public gardens and cemetery in Finsbury, London. In the time of the Great Plague it was used for the burial of the dead from the epidemic. Became the chief burial-ground for the dissenters of London. Bunyan and Defoe are buried here. Opened as a public garden in 1869.

Bunin, Ivan Alexievitch (b. 1870), Russian novelist and short-story writer. Resisting newer tendencies in Russian literature, B. remained a traditionalist, displaying in his work all the force and the weakness of Russian realism—its elaborate description, care for exactitude, vague touch of mysticism, carefully built-up study of characters. No Russian writer has been more careful to describe the exact colour of a thing seen, the exact tone of a thing heard. He had thus made himself master of a certain sort of style, aided by an enormous vocabulary. The main criticism of his product is that there is something static in his books. His characters do not act. They look, listen, dream, remember. His best-known books, many of which have been trans. in various languages, are *The Village* (1910); *The Cup of Life* (1914); *Monsieur de San Francisco* (1917); *The Love of Mitia* (1925); *The Well of Days* (1933); *Grammar of Love* (1935); *She* (1936); *Tolet's Liberation* (1937).

Bunion, inflamed swelling of the

bursæ mucosæ, or synovial sacs, occurring most commonly over the metatarsophalangeal joint of the first or fifth toe. This may be accompanied by corns or suppuration, and generally causes distortion of the joint. The most common cause of Bs. is pressure produced by badly fitting footwear, but the tendency may be hereditary. A cure may be effected by the removal of the cause of inflammation and treatment with soothing dressings, but in bad cases a surgical operation may be necessary.

Bunium is a name sometimes used for a genus of umbelliferous plants which are now included in the *Carum* and *Conopodium* genera. The tuberous roots when boiled or roasted are edible and are a good food for pigs.

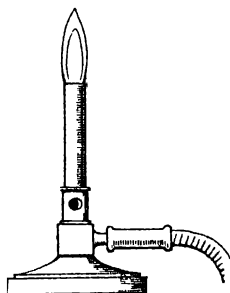
Bunker Hill, small hill in Boston, Massachusetts, U.S.A., which gave its name to the battle between the Eng. and Amers. which began the war of Independence, 1775. The Eng., under Howe, only succeeded in carrying the position at the third assault, and at enormous loss. The Amers., mostly hastily loved volunteers, were under Col. Prescott. A granite column indicates the site.

Bunkum, mere speaking to obtain publication in the press, or any humbug. Phrase arose in 1820, when, in the U.S.A. Congress, the member for Buncombe, N. Carolina rose to speak. He had apparently nothing to say, and members began to leave. He continued, telling the others they could go also, but his electors expected a speech from him and he was only 'speaking for Buncombe.'

Bunsen, Christian Charles Josias, Baron von (1791-1860), Ger. scholar and diplomatist, b. at Korbach, in the principality of Waldeck. His studies at Marburg were chiefly on theology, but in 1809 he went to Göttingen Univ., where he gave much attention to philology. In 1813 he won the univ. prize essay with the treatise *De jure Atheniensium hereditario*. Came to Berlin in 1815, where he became acquainted with the historian Niebuhr, by whose recommendation he was, in 1818, made secretary to the Prussian embassy at Rome. Before this, though, he had studied Persian and Arabic under Silvestre de Sacy, and had, in 1817, married Frances Waddington, by whom his *Memoirs* were later pub. In 1824, on the retirement of Niebuhr, B. succeeded him as resident minister. During his stay at Rome, B.'s researches led him in many directions, but chiefly towards Egyptology. After leaving Rome (1838) he was for two years ambas. in Berne. In 1842 he was transferred to the London embassy, where he passed the remainder of his diplomatic life. He resigned because he disagreed with Prussia's attitude towards the Crimean war, and retired to Heidelberg, being made baron in 1857. Among his numerous works may be named *Die Basiliken des christlichen Roms* (1843); *Aegyptens Stelle in der Weltgeschichte* (1844-57). See F. von Bunsen, *A Memoir of Baron Bunsen*, 1868.

Bunsen, Robert Wilhelm (1811-99), Ger. chemist and physicist, b. at Göttingen,

where he pursued his early studies, afterwards completing them at Paris, Berlin, and Vienna. In 1836 he became prof. of chem. at the Polytechnic Institute of Kassel, whence three years later he passed to Marburg. In 1852 he was made prof. at Heidelberg Univ., and here he spent the rest of his life. He was one of the greatest teachers of chem., but rigidly abstained from theoretical discussion. Hence no school rose under his name, in spite of the great number of his pupils who made their name as chemists. His publications were extremely numerous, and his discoveries very valuable. The burner which bears his name is known to all. His researches on cacodyl, begun in 1837, cost him the use of one eye, and almost proved fatal. Even before this he had discovered the use of hydrated ferric oxide as an antidote to arsenic. He was also the first to obtain magnesium in a metallic state. But the greatest of his achievements was the discovery, in company with his friend Kirchhoff, of spectrum analysis, a discovery which has proved of inestimable value both to chemists and astronomers. Among his works are: *Enumeratio ac Descriptio Hygrometrorum* (1830); *Gasometrische Methoden* (1837); and numerous pamphlets.



BUNSEN BURNER

Bunsen Burner, burner invented by the famous chemist Robert Wilhelm Bunsen of Heidelberg, about 1855, for use in the univ. laboratories so that coal gas could be burned without leaving a sooty deposit upon the articles heated. Air, about three vols. to every vol. of gas, is drawn into the burner tube through which the gas issues by a fine jet at the bottom. The mixture burns with a non-luminous flame and the combustion is complete. The Bunsen flame has an 'oxidising' zone, or outer envelope where oxygen is in excess, and a 'reducing' zone in the centre where unburnt gases are to be found. Such everyday apparatus as incandescent burners, gas cookers, and gas fires depend for their operation upon the use of the B. B. There are various modifications, e.g. the Meeker burner in which the burner head is fitted with a nickel grid $\frac{1}{2}$ in. deep, thus giving a large number of narrow Bunsen flames. This burner

allows the injection of a larger amount of air giving a very hot 'solid' flame. When supplied with compressed air at 10 lb. pressure it is very useful for furnaces, the temp. attainable being about 1830° C. (3326° F.).

Bunsen Cell, voltaic cell which contains a plate of zinc surrounded by sulphuric acid and a carbon plate surrounded by nitric acid, the two plates being separated by a porous partition of unglazed earthenware. It was invented in 1841 by R. W. von Bunsen, the Ger. chemist, who employed it to produce the electric arc. It is now obsolete.

Bunt, see SMUT.

Bunter (Ger. *bunter Sandstein*, variegated sandstone), in geology, a series of rocks forming the lowest div. of the Triassic system. It consists of variegated red sandstones and conglomerates. Their prin. exposure is in Germany. They may be subdivided as follows: (1) Lower B., consisting of fine red sandstone, with a thickness of as much as 700 ft.; (2) Middle B., of coarse sandstone, with a thickness of 1000 ft.; (3) Upper B., of red and green marls, varying in thickness. In England it occurs chiefly in the mudlands. Few fossils have been found in Eng. and Ger. beds, but plant life is represented by ferns and conifers.

Bunting, or *F. beriza*, is a genus of the family Fringillidae or finches. *E. citrinella*, the yellow B. or yellowhammer, is the commonest Brit. species. The next commonest species is the Corn B. (*E. miliaria*); another species, reed-B. (*E. schanicius*) is common on the Norfolk Broads. The Lapland B. and Snow B. (*Plectrophanes nivalis*) belong to other genera.

Bunting, Jabez (1779-1858). Eng. Wesleyan minister, was b. at Manchester, where he entered the ministry at the age of nineteen. He was four times president of the conference, and in 1835 was made president of the first Wesleyan theological college. For twenty years he was secretary to the missionary society. He may almost be considered the founder of the Wesleyan polity.

Buntingford, mkt. tn. of Hertfordshire, 7 m. S. of Royston, the terminus of branch line of the railway. It has almshouses and a school for mentally defective boys. Pop. 5000.

Bunyan, John (1628-88), author of the *Pilgrim's Progress*, was b. at Elstow, near Bedford. Members of his family, under the name Buington, lived in Bedfordshire as far back as 1199, whilst the grandfather of his own grandfather was a certain Thomas Bonyon (fl. 1512), a 'common brewer of beer' and 'common baker of human bread.' His mother d. in 1642, and soon after this he was drafted by a local levy into the parl. army. The war at an end, he returned to his native place. He thus describes his marriage in 1640 with a religious wife: 'This woman and I came together as poor as poor might be, not having so much household stuff as a dish or spoon betwixt us both.' She brought with her a book of her father's, entitled *Plain Man's Pathway to Heaven*,

which exerted a powerful influence over her husband, as may be seen in his *Life and Death of Mr. Badman* (1680). It was about this time that he underwent, like Blake and Cowper, many strange religious experiences. He had been very fond of ringing the bells of Elstow church, but was induced to forgo this harmless pleasure, as he believed the steeple would fall on his head did he persist in this crime. One time he was arrested in a game of tipcat by a voice which threatened him with hell if he did not repent him of his wickedness. Many long hours he spent in prayer, but it was a hard battle before he could finally renounce his pet vice of dancing on the village green. In his *Grace Abounding* he vividly describes the agony of his sufferings at this period.



JOHN BUNYAN

Dreadful hallucinations banished sleep from him at nights. He began to think, for instance, that he could have no faith unless he performed miracles, and that he would not be saved because he was not a child of Israel. But the clouds vanished and an active life healed his morbid imaginings. In 1653 he joined a dissenting community, and two years later began to preach in neighbouring vills. His first book, *Some Gospel Truths Opened* (1656), is a truly remarkable production, considering that its author was the son of a tinker and unlearned in syntax and spelling. It was one of a series of controversial writings against the followers of George Fox, the Quaker. In 1660 B. was confined to Bedford co. jail as 'a common upholder of sev. unlawful meetings,' and here he remained for twelve years. He spent his time writing and began his immortal *Pilgrim's Progress*. After the Declaration of Indulgence he was released, and was chosen pastor to his old church, but when the declaration was repealed, he was sent to the tn. jail for

six months, because he was a Nonconformist preacher. On regaining his freedom he took up his pastoral work once more, and continued it till his death on Snow Hill, Holborn. He was buried in the gloomy graveyard of Bunhill Fields. Whilst his *Holy War* (1682) is only inferior to *Pilgrim's Progress* as an allegory, the latter is, of course, his masterpiece. B. actually wrote some sixty books, but only these two and *Grace Abounding* continue to be read. Pub. in 1667 (the second part in 1684), it was at once appreciated by the common people, though it was some time before men of letters recognised the homely beauty of its biblical language, its spirited dialogue, and vivid characterisation, its imaginative descriptions, as for example of the Delectable Mts. and Vanity Fair, and above all the passion of its religious fervour. Christian's pilgrimage from the City of Destruction to the Celestial City has brought comfort and joy to men all the world over. That there is a peculiar fascination about the pilgrim is not to be denied, even by those who may be averse from B.'s religious opinions. Of this latter we have a striking instance in Dean Swift, who, in his famous Letter to a Young Clergyman, says: 'I have been better entertained, and more informed, by a few pages in the *Pilgrim's Progress*, than by a long discourse upon the will, and the intellect, and simple and complex ideas.' See also Cowper's moving lines on the pilgrim, beginning, 'O thou, whom, borne on fancy's eager wing.' Collected works ed. by C. Doe, 1692; G. Offor, 1853, 1862; H. Stebbing, 1859. Biographies and commentaries: Lives by R. Southey, 1830; Lord Macaulay, 1850; J. A. Froude, 1880; John Brown, 1885; C. H. Firth, 1911; also G. B. Harrison, *John Bunyan: a Study in Personality*, 1928; J. Lindsay, *John Bunyan: Maker of Myths*, 1937; M. P. Willcocks, *Bunyan Calling: a Voice from the Seventeenth Century*, 1943.

Bunyoro, see UNYORO.

Bunzlau, or Wegliniec, before the 1939-1945 war tn. of Prussian Silesia, but since then included in Poland. It is famous for the pottery made here since the sixteenth century. There were also before the war of 1939-45 glass works, wool spinning works, and iron foundries. The Moravian colony of Gradenburg is near by. Pop. 20,000.

Buonarroti, Michael Angelo, see MICHELANGELO.

Buonarroti, Michael Angelo, the Younger, see ANGELO BUONARROTI.

Buonfede, Appiano (1716-93), It. philosopher, was appointed to a professorship of theology at Naples in 1740. Later he joined the religious brotherhood of the Celestines, and became, in course of time, general of that order. His *Della Restaurazione di ogni Filosofia ne' Secoli* (1789), one of many works, gives a good account of sixteenth-century philosophy (Italian).

Buoninsegna, see DUCCIO.

Buononcini, Giovanni, see BONONCINI.

Buononcini, or Bononcini, Giovanni Maria (1640-78), It. composer, b. in

Modena, studied in Bologna. Entered service of Francis II., duke of Modena, became maestro di capella of San Giovanni in Monte. Wrote many instrumental and vocal compositions, and the theoretical work, *Musico pratico* (1773).

Buononcini, Giovanni Battista (1672-1748), son of the above. Became famous as a composer of operas, rivaling Handel for a time. He was court composer at Vienna for ten years. He wrote the second act of the famous pasticcio *Muzio Scevola* (an operatic medley performed in London 1721, and of which the other acts were written by Mattel and Handel). For some time he shared with Handel and Arcostri the directorship of the operatic enterprise known as the Royal Academy of Music.

Buoy, an anchored floating body used as a guide to navigation or for the purpose of mooringships. Mooring-buoys are made of wood or iron, and are used in places where anchorage is impossible or inconvenient. The more important use of Bs., however, is to mark the limits of a navigating channel, or to indicate the existence of dangerous obstructions as rocks, shoals, sunken wrecks, etc. Bs. may be differentiated by colour, shape, or the attachment of a signalling apparatus, as whistles, bells, fixed or flashing lights, etc. The following general principles are adopted in the use of Bs. in the United Kingdom: Bs. showing a conical top above water are called conical Bs., and should be kept on the starboard-hand; Bs. showing a flat top above water are called can Bs., and should be kept on the port-hand; Bs. showing a domed top are called spherical Bs., and mark the ends of middle-grounds. In the above definition, starboard-hand means the right side of the vessel in ascending a riv. or estuary, or in going with the main stream of the flood of the tide on the coast. In Scotland it is established that conical Bs. should be painted red and can Bs. black; spherical Bs. are painted with horizontal white stripes throughout the United Kingdom. Bs. bearing bells, lights, whistles, or distinguishing structures other than the foregoing are used for special positions. Bell-Bs. are actuated by the undulating of the waves; lights are provided by compressed oil gas, though acetylene and electricity are sometimes used; whistling is effected by the provision of a hollow cylinder extending some 30 ft. downwards; the up and down motion of the B. produces an inhalation and expulsion of air from this chamber, and the whistle is blown in a fitful manner corresponding to the motion of the waves. Wreck Bs. are painted green, and bear the word 'wreck.'

Buoyancy, that property by which a body tends to float in water, or, more scientifically, the pressure upwards on a floating body is equal to the weight of the body, and that weight is equal to the weight of the water displaced by the immersed part (Archimedes' principle). That is to say, if the floating body were removed, the space occupied by the immersed part would be filled up by

water, and there would still be equilibrium. The loss in weight of an immersed body is shown by Archimedes' principle to equal the weight of liquid. If a ship has a certain draught line to which she may safely be loaded, the measure of her B. may be taken as the additional weight required to bring the draught line on a level with the water. To ascertain the true weight of a body, a correction must be made of the weight in air, to allow for the B. of the air. This correction is zero if the body has the same density as the weights, but may be as much as six milligrams per gram weight of a body of sp. gr. 0.2 (using brass weights).

Bupalus (*B.* 540 B.C.), Gk. sculptor, with whom his brother, Athenis, is always associated, belongs to the school of sculpture in Chios at a time when its hist. just ceases to be legendary. The brothers never advanced to the representation of the nude: all their figures (carved in marble) were draped. B. did a figure of Tyche (Fortune) and also the Graces for the temple of Nemesis in Smyrna.

Bupalus is a genus of lepidopterous insects of the family Geometridæ, in which the wings are erect in repose and the larvæ have ten legs. *B. piniarius*, the bordered white moth, is a beautiful species found in the vicinity of fir-trees.

Buphaga is a genus of birds of the starling family, or Sturnidæ. *B. africana*, the ox-pecker, is generally seen in companies of seven or eight, attending a herd of buffaloes or antelopes.

Bupleurum (Gk. *Bovs*, ox, *πλεπούριον*, rib) is a genus of plants of the family Umbelliferae, which are natives of temperate climates in most parts of the world, and are remarkable for their simple leaves. The Brit. species are known by the name of hare's ear or buplever, and obtain the generic name from a supposition that they are injurious to cattle. (Another explanation of the name is that it refers to the ribbed fruits or ribbed leaves of the plant.) *B. rotundifolium*, the throw-wax, or throw-wax, has its upper leaves perfoliate, i.e. the basis of the leaf are joined around the stem, which seems to pierce the leaf.

Buprestidæ is the name of a family of coleopterous insects which have short antennæ and are very brightly coloured. Green is the most common colour, but blue, red, gold, and copper are also frequent, and have a burnished appearance. They live on the trunks of trees, crawl slowly, but when on the wing fly rapidly.

Bur, or **Burr**, a slight ridge of metal raised on edges of a line engraved by the burin, rocker, or dry point. Usually removed by a scraper, as it retains too much ink in printing the plate, producing the effect of a smear. Sometimes left to produce a peculiar effect of its own. Seymour Haden and other etchers often keep it; so does Rembrandt. In mezzotint engravings the whole effect comes from the bur.

Bur, or **Burr**, is the name given to a fruit which has developed a process like a hooked spine to aid it in its distribution. *Arctium Lappa*, the burdock, is a common

example, as is also the horse chestnut. In Scotland the word is applied to the thistlehead and to the firecone.

Buran, very violent sandstorm and snowstorm occurring in central Asia, or even in the Caucasus and on the outskirts of Siberia. The storm heralds itself in a peculiar manner, and comes on quite suddenly. The sky becomes inkly black, and the atmosphere is choking, on account of the clouds of fine sand blown along by the wind, which tears along at a remarkable velocity. Sometimes the wind is so cutting that it brings along in its train fine particles of partially frozen snow. There are two kinds of B., the kara-buran or black storm, and the sarik-buran or yellow storm.

Burano, is. and tn. of N. Italy, 5 m. N.E. of Venice. Some fishing, and important lace-making industry. Pop 10,000.

Burbage, James (d. 1597), one of the most famous actors of Elizabethan times. Renowned for being the builder of The Theatre in Shoreditch, and the Blackfriars Theatre in 1596. Also built the Globe with Shakespeare's financial help.

Burbage, Richard (1562-1619), great Elizabethan actor, son of the above; in spite of his short and stout figure, played with immediate success the leading parts in most of Ben Jonson's dramas, and was famous for his impersonations of Hamlet, Lear, Othello, and, above all, Richard III.

Burbank, Luther (1849-1926), Amer. plant-breeder; b. March 7, 1849, on a farm at Lancaster, Massachusetts. Began market gardening as a youth. In 1875 estab. a plant nursery at Santa Rosa, California. He gave up business in 1893 to devote himself to plant-breeding experiments, by which he gained world-wide celebrity. Introduced many famous varieties, especially the Burbank potato. See BREEDING.

Burbot, or **Eel-pout**, common name of *Lota vulgaris*, a species of the Gadidæ, or cod family, related to the whiting, haddock, and ling, and remarkable as being the only fresh-water fish of its family. It is common in European and Amer. streams, it is found in Great Britain chiefly in the Ouse and Cam.

Burchiello, It. poet of the fifteenth century. Date of birth uncertain, d. at Rome in 1448; his real name, Domenico di Giovanni. An original poet, who practised the trade of barber, and whose shop was the meeting-place of the literary wits in Florence. B. is a satirist, and his poems are sonnets of the comic burlesque type, and licentious. Different opinions are held as to the merit of B.'s poems; some regarded him as a genius little short of Petrarch, whilst others considered him to be merely 'a poetic buffoon.' Il Doni, his chief friend, wrote a commentary on his poems, which is as obscure as the text of the poems themselves.

Burckhardt, Jakob (1818-97), Swiss writer on social hist. and art critic, especially famous for his works on the It. Renaissance. Educated at Berlin and Bonn, and a pupil of Franz Kugler, the art historian. He was a prof. of hist. at Basle Univ. for nearly fifty years. His

first important work was pub. in 1842, and dealt with the works of art in Flemish cities. His masterpiece is his *Kultur der Renaissance in Italien* (1860), a brilliant survey of the period, in spite of defects arising from inherent difficulties opposed to all historians of this epoch. It was the compilation of his *Cicerone* or art guide to painting in Italy, first pub. in 1855, that led to his further study of the Renaissance and to the writing of *Die Kultur* and also of his *Geschichte der Renaissance in Italien* (1867). This latter work shows deep historical insight, but requires to be supplemented by a work like Sismondi's *Histoire des républiques italiennes* for details of the hist. of the various It. states. B. essays to prove that the moral and political salvation of the papacy was due to its mortal enemies; that but for the Reformation, which compelled the popes to put their house in order, their own degradation would have brought the whole eccles. state to an end; and that the enslavement of Italy by the Spaniards saved that country from the Turks and from barbarism. Works include *Die Zeit Konstantins des Grossen* 1853 (1924, a valuable study of the decay of ant. civilisation); *Der Cicerone: eine Anleitung zum Genuss der Kunstwerke Italiens*, 1855, trans. into Eng. by Mrs. A. H. Clough in 1873 and reprinted in 3 vols. in 1925; *Die Kultur der Renaissance*, 1860 (14th ed., 1925), trans. into Eng. in 1878, and again in 1929 by S. G. C. Middlemore; *Geschichte der Renaissance*, 1867 (7th ed., 1924); *Griechische Kulturgeschichte*, 1898-1902 (pub. posthumously). Consult: K. Joël, *Jakob Burckhardt als Geschichtsphilosoph* 1918; W. Behm, *Jakob Burckhardt*, 1930; A. von Martin, *Die Religion in Jakob Burckhardt Leben und Denken*, 1942.

Burckhardt, John Lewis (1784-1817), Anglo-Swiss traveller. Son of Col. B. who, becoming involved in the Fr. Revolution, nearly lost his life on the scaffold. He had a good education and his boyhood life was full of promise, for as one of the sons of an eminent Basle family, a choice of many careers was open to him. Accepted the offer of Sir Joseph Banks, a member of the African Association, to explore the hinterland of Africa. Disguising himself as a Muslim, he spent two years in Asia, during which he acquired so complete a mastery over Arabic and over the contents of the Koran that he passed among the natives themselves as a learned doctor of their law. After visiting Palmyra, Damascus, and Lebanon he went to Cairo. In 1812 he went up the Nile as far as Mahass, and after traversing the Nubian desert, succeeded, under the guise of a Syrian merchant, in making the pilgrimage to Mecca, by way of Jedda. He also journeyed to Mt. Sinai, but was prevented by death from joining the caravan which travelled towards Fezzan, whence he had intended to explore the sources of the Niger. Having accomplished so much at so early an age, speculation would be justified in assuming that he might easily, had he survived, have done enough to figure among the half-

dozen of the world's greatest travellers. He was a man of genuine greatness of mind and high principles of honour, qualities which, allied to his capacity for learning and power of observation, enabled him to overcome difficulties which would have baffled lesser men. The results of his travels were pub. in 1819 in *Travels in Nubia* by the Association for Promoting the Discovery of the Interior Parts of Africa; *Travels in Syria and the Holy Land* (1822); *Travels in Arabia* (1829); and *Notes on the Bedouins and Wahabys* (1830).

Burdekin, riv. of Queensland, Australia, rises not far from the coast, to which it runs almost parallel till it empties itself in Upstart Bay.

Burden, law term in Scotland, signifying any encumbrance or restriction on property of any kind. It must be secured legally, with a form stating the exact sum of money and the names of the persons concerned, given under the hand of the creditor. In the case of a B. on land, registration in the Register of Sasines is also essential. See the Scottish Land Titles Acts, 1868 and 1874.

Burder, George (1752-1832), Congregationalist pastor, after being minister in turn of the Independent church, Lancaster, 1778-83, and of the West Orchard chapel, Coventry, 1783-1803, was preacher at Fetter Lane chapel for the remainder of his life. Besides being honorary secretary to the London Missionary Society, he was editor of the *Evangelical Magazine*, and, above all, author of the remarkably popular *Village Sermons* (8 vols., 1797-1820).

Burdett, Sir Francis (1770-1844), Eng. politician, was the son of Francis B., and the grandson of Sir Robert B., bart. He was educated at Westminster and Oxford. The Fr. Revolution probably did much to mould his political opinions. He entered Parliament in 1796, having three years earlier married the heiress of the banker Coutts, and became distinguished from the first as an advocate of freedom and of radical opinions. He was arrested by order of the House for breach of privilege, having caused one of his speeches to be pub. His arrest took some time, since he barricaded his house and refused to surrender. He was, however, captured and taken to the Tower, where he was kept a prisoner until the prorogation of Parliament. His prin. political ideals were the passing of a reform bill and the taking away of Catholic disabilities. In 1820 he was again imprisoned for his denunciation of the Manchester massacres, and was fined £1000 and imprisoned for three months. He saw the Catholic Relief Bill passed in 1829, after he had made vain attempts to pass a similar measure in 1825, 1827, and 1828. After the passing of the Reform Act his active policy ceased, and he seemed satisfied with the victory which had been gained for freedom and reform.

Burdett, Sir Henry Charles (1847-1920), author and statist; son of Rev. Halford B., M.A., of Gilmorton, Leicester co.; made K.C.B., 1897, and K.C.V.O.,

1900. At one time superintendent of the Queen's Hospital, Birmingham, and of the Seaman's Hospital, Greenwich. Many publications on financial topics, including *Burdett's Official Intelligence of British, American, and Foreign Securities* (17 vols.); *The National Debt; Local Taxation in England and Wales; National Debts of the World; Municipal, County, and Indian Finance; Seventeen Years of Securities*.

Burdett - Coutts, Angela Georgina, Baroness (1814-1906), daughter of Sir Francis Burdett, was b. April 21. In 1837 she inherited almost all the great wealth of her grandfather, Sir Thomas Coutts, left by the will of his widow, the duchess of St. Albans, once Henrietta Mellon, the actress. Many offers of marriage were made her, but she resolved to remain single, and to devote her vast wealth to the cause of philanthropy. In 1881, however, she married Wm. Ashmead-Bartlett (1851-1921), who assumed her name, and was sev. times elected as member of Parliament for Westminster. In 1871 she was created a peeress, and in 1872 she was presented with the freedom of the City of London, being the first woman to receive this privilege. She d. on Dec. 30, 1906, and was buried at Westminster Abbey. Her philanthropic exertions were on such a vast scale that it is difficult to find any dept. of life they did not touch. She endowed the three bishoprics of Cape Town, Adelaide, and Brit. Columbia. Her love for her own sex caused her to do much for reformatories, and to secure great improvements in the education of girls at the national schools. Her interest in emigration was great, and she did much to aid in this work.

Burdock, or *Arctium Lappa*, is a common Brit. species of Compositae which is often found growing by roadsides. It occurs also in Asia and on the Continent. The leaves of the involucre are hooked and spinous when the fruit is ripe, and assist in its dispersal. The stem is about 4 ft., with lance-shaped leaves, and the lower leaves are 12 in. across, heart-shaped and thickly coated with white hairs on the underside. See BUR.

Burdon-Sanderson, Sir John Scott (1828-1905), Eng. physiologist, b. at Jesmond, near Newcastle-on-Tyne. Was the second son of Richard Burdon, who took the additional name of Sanderson on his marriage with Elizabeth, only daughter of Sir James Sanderson, first baronet, M.P. He went to the univ. of Edinburgh in 1847, came to London as practising physician in 1853, and was appointed medical registrar, then lecturer, at St. Mary's Hospital, London. In 1867 elected fellow of the Royal Society and Croonian lecturer. In 1870 devoted himself to scientific research. Initiator of new Eng. school of experimental work in pathological and physiological research. He was especially interested in the study of the functions of living tissues.

Burdur, tn. in Asiatic Turkey, 65 m. N.N.W. of Adalia. Pop. 127,000.

Burdwan, cap. of dist. B., W. Bengal, India, 67 m. from Calcutta. It contains the palace and gardens of the

maharaja of B. and numerous temples. It is a collection of 73 vills. and suburbs. Pop. 48,000. The dist. has an area of 2697 sq. m., and a pop. of 1,439,000. There are coal mines at Raniganj. The prin. exports are silk, jute, tobacco, rice, and iron and coal.

Burdy, Samuel (c. 1760-1820), Irish author, curate first at Ardglass, 1783; promoted to Killiclof, c. 1800. His *Life of the Rev. Philip Skelton* (1792) is one of Ireland's literary treasures. Amongst other poems, he wrote *Ardglass, or the Ruined Castles* (1802).

Bure, in Norfolk, Eng. riv., 50 m. long, joining the Yare at Yarmouth.

Bureau (Fr. *bureau*, coarse cloth used as a covering) denotes a desk, or writing-table. By metonymy the meaning is transferred from the desk to the business office or dept. of gov., and further to any group of officials. The word B. is used particularly to mean a gov. dept., especially in France. In the U.S.A. B. means a subdivision of a great executive dept., e.g. the Bureau of Statistics, a dept. of the Treasury Dept.

Bureaucracy, a term signifying gov. by depts., each ruled over by its separate chief, as opposed to gov. by ministers, owing a collective or associated responsibility to the people, and hence the word is often loosely used to mean officialism, red-tapeism.

Burette, apparatus used in practical chem. for delivering measured quantities of a liquid. It consists of a graduated cylindrical tube fitted with a stop-cock. A small glass float with a fine horizontal line engraved upon it may be used at the surface of the liquid to indicate the extent of movement of the top of the column with greater accuracy.

Burford, tn. on the Windrush, in the Woodstock div. of Oxfordshire, England. Historical interest attaches itself to B. Priory, and also to the place itself, as the scene of the overthrow of Ethelbald of Mercia by Cuthred of Wessex (A.D. 752). B. was obliged to send a member to Parliament in 1306, but petitioned to be excused henceforth and was so. The anct. corporation was dissolved in 1863. The seal dates from about 1250. The church of St. John the Baptist was originally Norman. Pop. 1500.

Burg, tn. of Saxony, Germany, 15 m. N.E. of Magdeburg by rail. It has manufs. of cloth and boots. Its prosperity is largely due to the Fr. and Walloon immigrants who came after the Edict of Nantes. Pop. 25,000.

Burgage Holding and Tenure. B. *tenure* denotes the particular feudal service or tenure of houses or tenements in anct. cities or bors. The incidents of this tenure, which prevailed in Normandy as well as in England, vary according to the particular customs of each bor. (q.v. and **BURGESS**). It is generally considered to be a species of socage tenure, as it was usually held either at a pecuniary rent or for services having no relation to military service. The later importance of the tenure was mainly in regard to the bor. franchise. B. *holding* is one of the forms

of feudal tenure in Scotland, and is that by which burghs-royal (see BURGHs) hold of the Crown the lands contained in their charters of erection. Property held on this tenure is at the present day practically all allodial.

Burgas, chief S. port of Bulgaria, on the gulf of Burgas, in the Black Sea. It has a considerable transit trade, and large exports of agric. produce, and also of clay for pipes and pottery. Pop. 41,000.

Burgdorf (Fr. *Berthoud*), tn. in the canton of Berne, Switzerland, on the R. Emme, 14 m. N.E. of Berne. It has silk and cloth-making industries. It is a picturesque tn., and its castle was the seat in which Pestalozzi set up his school, 1798-1804. Pop. 10,000.

Burgess, small pennant used by yachts and pointed or swallow-tailed according to the owner's status. Bs. of clubs are invariably pointed, that of a commodore or vice-commodore swallow-tailed. Only the royal yacht squadron may fly the white ensign, but other royal clubs may have a crown on the B.

Burgenland, prov. of Austria, has an area of 1532 sq. m. and a pop. of 265,000. It is composed of dists. ceded by Hungary after the First World War, and lies between Hungary and Austria on the E. and W., and Bohemia and Yugoslavia on the N. and S. Owing to its position the ownership of this area was in great dispute, Czechoslovakia and Yugoslavia desiring it as a connecting link between them, Hungary claiming it on historical, Austria on ethnographical, grounds. In 1919 it was allotted to Austria. The chief tn., Sopron, was, however, mainly Magyar in sympathy, and after considerable trouble and unrest, that tn. was given, by plebiscite, to Hungary. After the cessation of the war in 1945 B. was included in the Russian zone of occupation of Austria. The cap. of B. is Eisenstadt.

Bürger is the Ger. synonym for 'freeman.' Most of the men who inhabited Germania at the time of Tacitus were freemen. Each freeman carried arms, had slaves, and usually possessed land. The freemen attended the assemblies of the vil., hundred, and tribe. Charlemagne (A.D. 800-807) excluded the common freemen from the national diets, and limited their rights by enforcing arduous military service, etc. Henry the Fowler, king of Saxony, did much to advance the interests of the burgher class (A.D. 918).

Bürger, Gottfried August (1747-94), Ger. poet, son of a Lutheran pastor. In 1764 he entered the univ. of Halle as a theological student, but he early gave up theology for jurisprudence and a life of dissipation. His friendship with men of literary tastes saved him from his evil habits and he pub. his first poems in the *Musenalmannach*, of which he himself became editor in 1778. As a ballad writer his popularity spread far and wide. Such ballads as *Lenore* (1773), *Der wilde Jäger*, and *Das Lied vom braven Manne* are almost unequalled for dramatic intensity, virility of style, and atmospheric suggestiveness.

Burgers, Thomas François (1834-81), president of the Transvaal, a native of

Cape Colony, and minister of the Dutch Reformed Church. Elected president by the Boers, 1872, in a most critical period of the hist. of the Transvaal. Kruger systematically opposed B.'s policy, with the result that the Boers refused to pay taxes, and entered into warfare with Secocoeni, a native chief. Transvaal was also menaced by the Zulus. At this crisis England appointed Sir Theophilus Shepstone to inquire into matters; B. was compelled to resign, and the annexation of the Transvaal was formally declared in 1877.

Burgess (Low Lat. *burgensis*, citizen; old high Ger., tn.) formerly meant simply an inhab. of a bor. or a leading craftsman in a guild belonging to a bor. Gradually the term B. came to be applied to a freeman of a bor. possessing a tenement in a bor. The early importance of Bs. lies in the fact of their inclusion as one constituent part of the Third Estate of the Realm or Commons in Parliament. In 1264 Simon de Montfort, in issuing writs for a parliament in London, summoned for the first time two citizens from each city and two Bs. from each bor. to sit with the knights of the shire, thus eliminating the barrier which had hitherto kept them apart. From this union springs the bulk of our national liberties. The Bs. or representatives of bors. attended Parliament regularly from the time of the Model Parliament, 1295. The creation in 1835 of the 'municipal corporation' as a unit of self-gov. included that of a uniform qualification for the municipal franchise. That qualification is known as the old B. qualification, and is now practically the same as, but not necessarily co-extensive with, the parl. franchise. The qualification of a B. is enrolment on the B.-roll as a ratepaying occupier of a house or other building in the bor. or within 7 m. of it. Women may be Bs., and are now also eligible for corporate office. Where the bor. is a city, the Bs. are called citizens. See also BURGH.

Burgess, John Bagnold (1829-97), a Brit. painter, b. in London. He studied in the Royal Academy, and later lived for some years in Spain, whence he chose the greater part of his subjects. A.R.A., 1877, R.A. 1889. Among his best-known pictures are 'Bravo Toro' (1865); 'Stolen by Gypsies' (1868); 'Visit to the Nursery' (1870); 'Licensing Beggars in Spain' (1877).

Burgess, John William (1844-1931), Amer. historian, b. in Giles co., Tennessee. Educated at Cumberland Univ. and at Göttingen. Appointed in 1873 prof. of hist. and political science at Amherst College. Later, prof. of political science and constitutional law at Columbia College. Works: *Political Science and Constitutional Law* (1890); *The Middle Period of United States History* (1897); *The Civil War and the Constitution* (1901); *The Transformation of the Constitutional Law of the United States between 1891 and 1920* (1921); *Recent Changes in Constitutional Theory* (1923).

Burgess Hill, tn. in Sussex, England, 8 m. N. of Brighton. Pop. 6000.

Burgh means a Scottish tn. possessing

incorporation (corresponding to the Eng. 'borough') and a local (generally petty) jurisdiction. Formerly only royal Bs. could send representatives to Parliament, but since 1832 there have been parl. Bs. or tns. not being royal Bs. but sending representatives to Parliament, e.g. Falkirk, Leith, Hamilton. The General Police Act for Scotland extends the meaning of B. and defines it to mean all Bs. and populous places whose boundaries have been fixed. The Act further provides that the sheriff may, on the representation of seven or more householders, fix the boundaries, and thereby constitute a B. for purposes of local gov. The jurisdiction of B. magistrates is practically restricted to police offences, payment of B. dues, and summary ejections. See W. M. Mackenzie, *The Scottish Burghs*, 1948.

Burgh, Hubert de (d. 1243), most famous of an Eng. noble family of the Middle Ages. Served Richard Cœur-de-Lion, then John, siding with him against the barons but urging the signing of the Magna Charta. Justiciar of England. During Fr. war checked Louis at Dover Castle, and defeated the Fr. fleet, 1217. About 1221, with Langton, Hubert became regent for Henry III. After rising to great power, fell into disfavour (1232), and lost his influence at court. Shakespeare's account (*King John*) is unauthentic. Consult Stubbs, *Constitutional History of England*, vol. II, 1896.

Burghersdorp, tn. of Cape Province, near banks of Stormberg Spruit, on railway to Aliwal North, about 39 m. from it. Important trade in wool. Was in Boer hands early in S. African war. White pop. over 2000.

Burghley, William Cecil, see BURLEIGH, LORD.

Burgin, George Brown (1856-1945). Eng. author, son of Joseph B., barrister, secretary of Author's Club, 1905-8; joint honorary secretary of New Vagabond Club; writer of many books, amongst which may be mentioned: *The Judge of Four Corners* (1896); *The Belle of Santiago* (1911); *Dickie Diver* (1912); *The Duke's Stragem* (1931); *A Pious Fraud* (1938).

Burgkmalr, Hans (1473-1531), Ger. painter and wood-engraver, was a friend of Albert Dürer, and father-in-law to Holbein the elder. His renown rests on his woodcuts—nearly 700 in all—which are truly remarkable for their faithful presentation of contemporary life, and for their dramatic strength. Especially noteworthy are his engravings for *The Triumph of Maximilian*, and for a Ger. translation of Petrarch's Lat. treatise *De Remedii utriusque Fortune*. His wood-engravings are wrought with fire and the vigour of a robust, struggling, and reforming age. A portrait of himself and wife may be seen in Vienna, whilst the galleries of Munich, Berlin, and Augsburg, his native place, possess examples of his work in fresco painting.

Burglary (etymology uncertain. The O.E. word was *burg-bræce*, breaking into a strong place. Wyld gives Low Lat.

burg(u)lator. In Norman-Fr. the word was *burgessour*, from Fr. *bourg*, the second element being given as O.F. *laire*—mod. Fr. *larron*—but the evidence shows that the *l* is intrusive. A common suggestion is that the word comes through O.F. from Lat. *burgi latrocinium*). In O.E. law B. was known as *hamsocna*, in Eng. common law, is defined as the breaking and entering a dwelling-house by night, with intent to commit a felony. *Breaking* may be either by forcing open a closed window, door, etc., by some necessary aperture such as a chimney, or by collusion with a servant or inmate of the house. It may be before the felony, to secure entrance, or after it, to secure escape. For *entry* it is sufficient that the hand or arm should be inserted. A *dwelling-house* is any permanent building in which the owner or some tenant sleeps. Any building or out-house forms part of the dwelling-house only if it be connected with the same either directly or by an enclosed passage. *Night* is defined as the period between 9 p.m. and 6 a.m. The punishment for B. is penal servitude for life, or any period not less than three years' penal servitude, or two years' imprisonment. If the offence be committed by day, or in some place other than a dwelling-house, it is not B., but housebreaking. In Scotland all cases fall under the law of housebreaking, and the name 'B.' is not used. In the U.S.A., on the contrary, B. is made to cover many cases of housebreaking, and is never punished by penal servitude for life.

Bürglen, picturesque situated vil. in the canton of Uri, Switzerland, the traditional home of Wm. Tell, who is said to have been b. here and to have met his death at a spot indicated by a stone cross, while rescuing a child. Pop. 2000.

Burgmaster, title of chief magistrate of a Dutch, Flemish, or Ger. tn. It corresponds to the Eng. 'mayor' and Scottish 'provost.'

Burgos, prov. of Spain, in area 5480 sq. m. It is a tableland crossed by ranges of high mts., with a severe climate and a barren soil, watered by the Ebro and the Douro. The 394,000 (in 1947) inhab. live in small vils. and are mostly occupied in growing corn and raising cattle. Some make paper hats, gloves, linen, and crockery. B., the city of the legendary hero of Spain, the Cid, is the cap. of the prov. with a pop. (1947) of 78,900. It was first formed into a tn. by Alfonso III. (866-910), who surrounded sev. hamlets with a wall to defend them against the Moors. The cathedral is the most glorious Gothic monument in Spain, and there are other beautiful old churches and palaces of the medieval nobility. The museum contains some very noble sepulchral monuments, as does also the convent of las Huelgas founded by Alfonso VIII., son-in-law of Henry II. of England. Three m. from B. is the Cartuja de Miraflores, a monastery in which are more superb monuments. The citadel, now a heap of ruins, successfully resisted the duke of Wellington in 1812. It was in B. in July 1936 that Gen. Franco set up his

Insurgent gov. under the title Junta de Defensa Nacional.

Burgoyne, John (1722-92), Eng. general. He entered the army at an early age, and was also at an early age compelled to sell out in order to pay his debts. His youth was further distinguished by his runaway marriage with the daughter of the earl of Derby. He spent the years following the selling of his commission abroad, but was, by the influence of his father-in-law, restored to his rank in the army in 1758. He became the first commander of light infantry in the Brit. Army in 1759. He became an M.P. in 1761, and was made a brigadier-general in the following year. At the close of the Seven Years war he devoted his time to politics and the drama, his first play being produced in 1775. In that year, on the outbreak of hostilities with the Amer. colonists, he was appointed to the command of a div., and made a fatal attempt to attack the colonists from Canada. He was surrounded at Saratoga by Gen. Gates and the Amer. Army, and forced to surrender with 3500 men. He was deprived of all his appointments, but was restored to them in 1782. He retired, however, into private life, and occupied his time with dramatic work. His most popular work, *The Heiress*, appeared in 1786. In 1808 his poetical and dramatic works were pub. See W. L. Stone, *Campaign of Lieut.-Gen. J. Burgoyne*, 1877; F. J. Hudson, *Gentleman Johnny Burgoyne*, 1927.

Burgoyne, Sir John Fox (1782-1871), Eng. field marshal, a natural son of John B. (q.v.) and Susan Caulfield, an opera singer. His education was received at Eton and Woolwich. He obtained his commission in 1798, and two years later served in Abercromby's expedition to the Mediterranean. He joined Wellesley in Portugal in Feb. 1809, was present at the passage of the R. Douro and the taking of Oporto, being promoted captain. His military skill at the sieges of Badajoz and Ciudad Rodrigo won him the rank of lieutenant-colonel in 1812. Chairman of the Irish Board of Public Works, 1831-45. Later he served with distinction at the Crimea, and was promoted to general in 1855, and created a baronet in 1856. Field marshal, 1868.

Burgstädt, tn. in Saxony, Germany, 35 m. S.E. of Leipzig. Its manufs. are linen and gloves, and cotton printing and wool weaving are carried on. Pop. 9000.

Burgsteinfurt, tn. in Westphalia, Germany, 17½ m. N.W. of Münster, on the Aa. It has textile manufs., and a fine castle. Pop. 6000.

Burgundii, The, were a tribe of N. Germany, who early estab. themselves about the source of the Mein (Main). Although they took part in the great barbaric invasion of Rome in 406, they were often loyal allies of the Romans against the Huns and Franks. In 475 they occupied the Rhone valley. They had adopted Christianity before Clovis, the Frankish king, finally put an end to their kingdom in 534.

Burgundy, Dukes of, see PHILIP THE BOLD and PHILIP THE GOOD.

Burgundy, formerly an independent monarchy, and later a prov. of France. Its earliest inhab. were a Ger. tribe, the Burgundii (q.v.), who had extended their settlement from the banks of the Oder and Vistula to the Rhine and Neckar. A defeat by the Huns, followed by the chaos resulting from the decay of the Rom. Empire, saw them holding sway over the whole of the Rhone valley. They accepted Christianity later, and in 534 were conquered by the Franks. In 832 B. regained its independence and gradually attained great power; but a later absorption of the prov. by the Gers. saw its gradual decomposition into a number of small states, all of which were finally taken over by France. It now comprises the depts. of Ain, Côte-d'Or, Saône-et-Loire, and Yonne, and is world-famous for its wines. Its prin. tns. are Dijon, Mâcon, Autun, Châlon-sur-Saône, and Bourg, and it is watered by the Rhone, Seine, and Loire Rs.

Burgundy Pitch, yellowish-white resin prepared from common frankincense, the exudation of the Norway spruce-fr. (*Abies excelsa*), by melting it in hot water and separating it from the greater part of the oil which it contains. B. P. is hard and brittle, and can be distinguished from its many imitations by its pleasant smell and lack of bitterness. It is used in medicine for plasters, and acts as a mild irritant.

Burgundy Wines, fine and world-famous wines produced from the vines cultivated on the sun-bathed slopes of the low hills of Côte-d'Or, the dept. which, together with Yonne and Saône-et-Loire, corresponds to the old dist. of Burgundy. Beaune is the centre of the dist. and of the trade. The most celebrated red wines are Romanée, Chambertin, Richebourg, and Clos de Vougeot, while the finest white Burgundies are those of Montrachet and Chablis. The celebrated Hospice de Beaune derives its revenues from some of these vineyards.

Burhanpur, tn. in the Central Provs. of India on the Tapti with 40,000 inhab. (30 per cent in 1947 were Muslims). It was for centuries the cap. of independent Moslem princes.

Burial Acts. Burial is the ordinary mode of disposing of the body of a deceased person, but the Eng. law contains no prohibition of other methods, so that cremation was lawful even before the Cremation Act, 1902, was passed to regulate it. Nor does the law require burial in any particular place; nor, if elsewhere than in consecrated ground, is any particular ceremony prescribed; and burial in private ground is allowable provided such burial does not amount to a nuisance or infringe any statutory prohibition against burial in any particular locality. But all burials must be effected in a decent and orderly manner whether with or without a religious service; and disregard of this provision of the Burial Laws Amendment Act, 1880, is a misdemeanour. Under the Act of 1880, wilful obstruction of a burial or burial service, or the delivery of an address

which is not part of the religious service permitted by the Act or by any lawful authority, is a misdemeanour. No one can by will or in any other way legally dispose of his body after death, and any such testamentary disposition may be ignored by his personal representatives; but he may effectively give directions regarding the anatomical examination of his body. In most par. there is a burial-ground recognised as the par. churchyard, and this place constitutes the ordinary place of burial unless closed for burials by Order in Council, contravention of such order involving penalties under the Burial Act of 1855. There is no certainty as to what conditions constitute a par. churchyard, but consecration, whether actual or presumed, seems to be essential, and length of time during which use as a par. churchyard has prevailed is really the only conclusive evidence of a presumption apart from actual consecration. Every parishioner and inhab. of a par. and every person dying in the par. has the right to be buried in the par. churchyard or burial-ground, a right enforceable at common law as well as by the eccles. court. The churchwardens and incumbent can, however, permit non-parishioners to be buried in their par. churchyards, subject to a possible injunction by the chancery div. if such interment amounts to actual inconvenience to the parishioners. The right of burial does not carry with it a right to have a monument erected nor a vault. Generally burial in an iron coffin will be regarded by the eccles. court as proper. Parishioners have no right to burial within the church. Burial in a church depends on the issue of a faculty in that behalf. Erecting a monument to the dead in a churchyard or church otherwise than under the authority of a faculty therefor is an offence cognisable by the eccles. court. Also, in the absence of a faculty, there is no exclusive right to the use of a particular part of the churchyard for burial purposes. By the eccles. canons it is the duty of every minister of the Church of England to perform the burial service over the body of any person not excluded from Christian burial, and otherwise entitled to burial in a churchyard; and refusal or failure to do so may entail suspension from his ministry and possibly an action for damages. Suicides, where a verdict of *felo de se* has been found, must be interred in the ordinary manner as if no such verdict had been returned, but the rites of Christian burial are not to be performed on interment, so that such burial may be without any religious service or with such ordinary Christian service other than that of the Church as the person having charge of the burial thinks fit. The common law allows no fee in respect of burial, but such fees may be due by immemorial custom or by statute. Fees alleged to be due by custom are commonly paid, and generally to the incumbent. Additional fees are paid for the erection of monuments or vaults. The Eccles. Commissioners have power to fix tables of burial fees, and

such tables must be registered in the diocesan registry. Burial-grounds are provided and maintained by burial boards and other authorities under the Burial Acts, 1852 to 1906. The power of adopting these Acts for a poor law par. in an urb. dist. rests with the vestry, subject to the consent of the urb. authority, and the vestry can elect and control the burial board. Consent of urb. authorities is indispensable to the adoption of the B. A., and in some cases the sanction of the Ministry of Health is necessary. The burial board may also in some cases contract with cemetery owners, and the board has all necessary legal powers to acquire the requisite land. Urb. authorities, that is bor. councils and non-municipal urb. dist. councils, may exercise the functions of a burial board. In a rural par. the par. meeting have exclusively the power to adopt the B. A. for the whole of the par. subject, if the par. is divided for eccles. purposes, to the consent of the Ministry of Health. In London, outside the city, the B. A. were declared by the London (Adoptive Acts) Scheme, 1900, to be in force in certain metropolitan bor., while in the remaining bor. the Acts may be brought into force by Order in Council. The burial authorities for London are the metropolitan bor. councils, and in most cases they are not subject to the control of any vestry or similar body. The corporation of the City of London have the functions of a burial board for the city. Under the Public Health (Interments) Act, 1879, any urb. or rural dist. council may provide a cemetery and must if so required by the Ministry of Health. There are also statutory provisions for regularising the provision and maintenance of private cemeteries. These are usually owned by companies, who must provide for due registration of burials in the cemeteries owned by them. The powers of a burial authority to provide and maintain burial-grounds or cemeteries extend to and include the provision and maintenance of crematoria. (See also CREMATION.)

Burial Customs. From the earliest times definite customs and manners have crystallised around the act of human sepulture, and in numerous instances these bear a striking similarity to one another, although widely separated by circumstances of time and geography. It is well known, for example, that many primitive peoples, both prehistoric and modern, bury their dead in the foetal posture—that is, with knees drawn up to the chin, and placed upright in the grave dug to receive the body. Early burials in many countries bear traces of fire, and show that cremation after inhumation was resorted to. Later a rude effort at preservation of the corpse was attempted, as in prehistoric Egypt, where bitumen was smeared over the remains—the first attempt at mummification. In the evolution of B. C. we can distinctly trace the various steps as follow: eating of dead kindred, in order to partake of their virtues, pounded bones

or ashes eaten by kinsmen, water in which the body was placed drunk by kinsmen, foetal burial, attempts at cremation, rude embalment, urn burial, aerial burial, inhumation in cists or stone coffins, modern sepulture. It is not advanced that these methods came into use one after another in any one sphere, but that this is an ideal course of their evolution culled from the mortuary customs of many lands and ages.

Europe.—Paleolithic burials are seldom encountered in Europe, and consisted chiefly in placing the remains in caves or similar retreats. It is very unlikely that any fixed custom attached to the disposal of remains until at least later Paleolithic times. In Neolithic times foetal inhumation was probably customary, but in some centres cremation and burial in stone cists and urns prevailed. In later Neolithic times burial in barrows or mounds obtained. The shape of these varied with race, the long-skulled aborigines who preceded the Celts in Europe placing their dead in long barrows, whilst the round-skulled Celts buried theirs in round barrows. Many of these barrows are honeycombed with graves, and yield rich results to the archaeologist, who usually discovers therein tools and weapons of the Bronze period. It was customary for the early races of Europe, and indeed for primitive races all over the globe, to inter with their dead such articles as they considered would be necessary for their comfort in the world of shadows, and it is fortunate for modern archaeology that primitive graves have yielded these in abundance. Graves of the Bronze Age all over Europe bear a great resemblance to one another. In Greece and Rome cremation was resorted to. Burials of the early Christian period were usually made in catacombs, such as those at Rome, where the bodies were placed in niches in the walls, and their resting-places decorated with paintings and sculpture. Outside of the Roman sphere of influence burial in Europe retained its primitive character, the offering of objects to the *manes* of the deceased being almost universal. With the introduction of Christianity, however, sepulture in consecrated ground began to be regarded as essential for the good health of the soul, and this obtained throughout the Middle Ages, and to some extent is still looked upon as desirable. Propitiation of the *manes* of the deceased is seen in Europe in the custom which until comparatively recently obtained in Northumberland of sacrificing domestic animals prior to the burial of the dead, and even a trace of human sacrifice may be preserved in the custom at highland funerals of the friends of the dead person fighting until blood was drawn—an example of the substitution of the part for the whole. Even the practice of the eating of dead kindred is typified all over Britain by the revolting custom of 'sin-eating,' in which a paid person devours a piece of bread and cheese or a cake and drinks a mug of ale over the coffined body of the dead. Until the beginning of last century the

burial of a gipsy chief was often accompanied by the sacrifice of his horse, either as a propitiation to his spirit, or because it was regarded as essential to his comfort in the next world.

Asia.—Burial in early Palestine appears to have been effected in caves and similar places, where the corpse would not be readily got at by beasts of prey. In Moslem countries inhumation in cemeteries is common, and the turban cut in stone, the symbol of the Muslim faith, is usually found upon the graves. In India the Parsees expose the dead off the summits of towers, where they are devoured by birds of prey. The splendid tombs of Hindustan are eloquent witnesses of the manner of disposing of the dead which obtained among those of the Brahman religion. In China, where ancestor-worship is the national religion, a paper house is constructed for the soul of the departed about 10 ft. high by 12 ft. deep. This contains various apartments, and a paper image of the dead is placed inside it, with paper models of food and all necessities. The deceased is afterwards worshipped by his children. In China mourning materials are white. Throughout Asia customs of sepulture differ but in minor details, and in Japan, Burma, Korea, and the Mongolian peninsula consist of burial according to the rites of ceremonial Buddhism.

America.—In America many of the customs alluded to as prevalent in prehistoric times obtain. Thus interment in mounds and stone cists or caves is frequent, but tribal custom often dictates methods of sepulture which are strictly adhered to. Thus the Mohawks formerly made a large round hole in which the body was placed in a squatting posture, after which it was covered with timber and earth. Some Carolina tribes placed the corpse on a cane hurdle and deposited it in an outhouse for a day. It was then wrapped in cane matting or rushes and deposited in a grave, logs or stone slabs being placed over it so that the earth might not fall on the body. The Creeks and Seminoles of Florida generally buried their dead in a circular pit about 4 ft. deep, the corpse with a blanket or cloth wrapped about it being placed in a sitting posture, the legs bent under and tied together. Wooden vaults are also sometimes found, as are dome-shaped stone vaults. Sometimes clay was spread over the corpse and fire applied before burial. Sometimes even mummification was practised. Aerial sepulture in trees and upon raised platforms, burial in lodges, in canoes and urns, are other American modes of disposing of the dead. In S. America very similar methods are in vogue, the habit of scraping the bones and hanging them up in baskets in trees or at the doors of lodges being very common. Mummification was practised in anct. Peru.

Africa.—The funerary customs of Egypt are too well known to require lengthy description. (See EMBALMING.) There were three modes of mummification, undertaken by a special caste who were abhorrent to the rest of the pop., namely

entire embalmment, which cost about £700; partial embalmment; and a mere smearing over of the corpse with bitumen. The mummy was placed in a rock-cut tomb, surrounded with paintings representing objects supposed to be useful to it, and *ushobtu* figurines which represented servants to attend to its requirements in Amenti or Hades. The modern tribes of the Sudan practise burial after the Moslem fashion, whilst those of central Africa, if cannibals, often devour the corpse or a portion of it, and if non-cannibal bury it, often with many strange ceremonies. Some tribes, however, merely take the body into the bush or forest and leave it to be devoured by wild animals.

In Polynesia until recently it was customary to devour a dead relative in order that his virtues might enter the bodies of his descendants. Among the Eskimos burial by canoe is often practised, and in Australia the nomad tribes either leave the body to rot, or bury it in the ordinary manner. See Sir T. Browne, *Hydrotophia*, *Urne Buriall*, 1658; V. Schulze, *De christianorum veterum rebus sepulchralibus*, 1879; J. Fergusson, *History of Indian and Eastern Architecture*, 1910; G. Quell, *Die Auffassung des Todes in Israel*, 1925; B. S. Puckle, *Funeral Customs*, 1926; E. Bendaun, *Death Customs: an Analytical Study of Farina Rites*, 1930; Sir J. G. Frazer, *Garnered Sheaves*, 1931; L. V. Grinsell, *Ancient Burial Mounds of England*, 1936.

Buriats, race of Mongolians inhabiting the neighbourhood of Lake Baikal. They resemble the Chinese in their small slanting eyes and their pigtails. Their religion is Buddhism, though there are Shamanists and Christians among them. Contact with the Russians took place first in the sixteenth century, from which people they learned farming and irrigation, occupations in which they excel the Russians themselves. Their country has been formed by the Soviet Gov. into the Burlat-Mongolian autonomous S.S.R. with an area of 419,000 sq. m. and a pop. of 485,000. Its cap. is Verkhne Udiensk. Pop. 30,000.

Buridan, Jean (c. 1297-c. 1358), Fr. philosopher. A native of Artois, he studied under Wm. of Occam in Paris, where he later became prof. of philosophy, and, in 1327, rector. Under an ordinance of Louis XI. the reading of his works was prohibited. His philosophy is based upon the doctrines of his teacher Occam. His ideas in connection with free will, contained in his comments on Aristotle's *Ethics*, bear a resemblance to Locke's.

Burigny, Jean L'Evesque de (1692-1785), man of letters, is remarkable for his extraordinary versatility and the volume of his publications, as well as for his erudition. Among his works are biographies of Grotius and Erasmus (1750 and 1757); a treatise on papal authority (1720); and a *Histoire des révolutions de l'empire de Constantinople* (1749).

Burins, see CHISELS.

Burid Palm, or *Mauritia tinifera*, is a handsome species of Palmaceæ found in

S. America, especially in Brazil. It is one of the loftiest of palms, growing to a height of 100 to 120 ft., and it yields many useful products. Among these are a pulp from the fruits which is converted into a sweetmeat, a juice which makes a delicious beverage, and leaf-fibre used for making mats.

Burkburnett, city in Wichita co., Texas, U.S.A. Centre of a large oil-field. Pop. 5300.

Burke, Edmund (1729-97), Eng. statesman. Very little is known of the early life of B.. In fact the exact date of his birth is hidden in some obscurity, although it is most probable that he was b. on Jan. 12 1729. His bp. was Dublin,



EDMUND BURKE

An engraving after a painting by Sir Joshua Reynolds

where his father was at this time practising as an attorney. His father was a Protestant, a faith in which Edmund himself was brought up; but his mother belonged to the Rom. Catholic faith, and this, together with the fact that his earliest schoolmaster belonged to the Society of Friends, gave him the foundations of the toleration which he later applied to religious questions. In 1743 he entered Trinity College, Dublin, where he studied hard but in a desultory fashion, making himself, however, well acquainted with the Lat. authors. He took his degree in 1748, and two years later came up to London to study law. His health at this time was weak, and he spent a great deal of his time travelling, and of this period of his life we know little, since there are no letters of his to be found which deal with it. In fact we find him later writing 'to atone' for his neglect of his chief correspondent Richard Shackleton, the son of his old schoolmaster. In 1756 he seems to have been living near Temple Bar, and to have made the acquaintance of sev.

well-known men, such, for example, as Garrick. During this period of his life he showed an increasing disinclination to follow the legal profession and an increasing devotion to letters. In 1755 his attitude towards law and his desultory career so displeased his father that he stopped his allowance. B. therefore set himself to work to gain a living for himself. In 1758 his first pub. work appeared, *A Vindication of Natural Society*, which purported to be a posthumous work by Bolingbroke. It was a satire on the views of that statesman, but so close was B.'s imitation of Bolingbroke's style, and so grave the irony, that its point as a satire was largely missed. If as a satire the book failed its style attracted immediate attention to the author, and in the same year his fame was enhanced by the publication of the *Philosophical Inquiry into the Origin of our Ideas on the Sublime and the Beautiful*. This book attracted so much attention that it was trans. by Lessing into Ger. Towards the end of 1756 B. married, his wife being the daughter of his medical man, Dr. Nugent. They had two sons, Richard, b. in 1758, and Christopher, who d. in his infancy. By 1756 we may definitely say that B.'s political ideas are fixed, and undergo from this time forward no great change. His mind was also turning from abstract speculation to the solution of the political and economic problems of the time. His *Abridgment of the History of England* was partially printed during this year (1757), but was not pub. until after his death. In 1758, when the events of the Seven Years war were just beginning to favour England, B. put forward the idea of the *Annual Register*, a publication which was to give a review of the chief events and movements of the year. The first vol. of this work appeared in 1759, and B.'s connection with the pub. continued actually until 1788, and probably even after that date he had much to do with it. He gradually came to be well known in society, and in 1759 he became secretary to 'Single-speech Hamilton,' whose affairs occupied the whole of his time and prevented him doing any literary work except on the *Annual Register*. He accompanied his patron to Ireland when he was made secretary to the earl of Halifax, and on their return to England (1763) B. was awarded a pension of £300 per annum. He remained with Hamilton until 1764, but in that year threw up his pension owing to Hamilton's demands on the whole of his time and service, and returned to live with his father-in-law. But his financial position at this time was not so bad as it had been, and there is evidence that he had some command of money. During the whole of this time he had kept up his friendship with Johnson, Reynolds, and Garrick, and his reputation as a talker and thinker ranked very high indeed. In 1765 he was appointed private secretary to the marquess of Rockingham, who had just been made Prime Minister. His appointment was the signal for the beginning of

those slanders that never really ceased. He was a papist and a Jesuit according to the tales which at this time reached the ears of his new patron. But his manner under accusation speedily won the heart of Lord Rockingham, and he can be said to have become from this time not only his secretary but also a personal friend. In 1765 he was returned for Wendover, and in Jan. of the following year, 1766, he took his seat and began his career as an active politician. He spoke on the Amer. question and against his party when he made his maiden speech about a fortnight later. He speedily gained for himself a reputation as a parl. speaker, and although his voice was harsh and his action awkward, he was soon one of the most eloquent and powerful speakers in the House. In 1766 the Rockingham ministry was overthrown, and B. spent a short time in Ireland. On his return he was offered a post in the administration which the earl of Chatham was forming, but declined to leave his old leader, and became during the session one of the leading members of the Opposition. While faithful to his party, he did not follow it blindly, and allowed himself some latitude in giving his vote, especially as he was gradually making himself indispensable to it. In 1768 he purchased a house and an estate. But during the period which immediately followed B. and his relative and friend (Wm. B., q.v.), suffered great financial losses. B., however, still lived the same extravagant and generous life that had distinguished him previously. In 1769 he pub. *Observations on a late Publication on the Present State of the Nation*, and made a brilliant criticism of the policy of Grenville. He was much absorbed during the year with questions which touched the constitution and was against the policy which the House adopted towards the Wilkes v. Luttrell election. In 1770 appeared his famous *Thoughts on the Present Discontents*. In this he put forward the grievances of the people, and showed that the fault lay not with the people but with the Gov., and with the court and its secret cabals. He attacked the policy of the House towards the printing of reports of the proceedings, and was himself bitterly attacked, being without the slightest foundation charged with the authorship of the *Letters of Junius*. In 1772 he visited France, and there saw Marie Antoinette at Versailles, a visit which he was to remember. In 1774 began the famous alliance between himself and Charles James Fox, who, a youth of twenty-five at this time, had been won over by the influence of B. and always regarded him as his political master. From 1774 until the outbreak of war in 1775 he was continually striving for conciliation with the Amer. colonies. He was elected member for Bristol in this year, and introduced his famous resolutions for conciliation. In 1776, on the failure again of his attempts at conciliation, he withdrew practically from all debates on Amer. questions, but he still played his part in the House. His speech against the employment of Indians in

America was one of the most brilliant which he ever made (1778). The next few years were occupied with plans for economic reform and with pleadings for Catholic relief. His known advocacy of Catholic relief measures roused the anger not only of the people of London, but also of his constituents at Bristol, who rejected him at the next election. The rejection of B. by Bristol was compared at a later date by Lord John Russell to the rejection of Macaulay by Edinburgh. He, however, received a seat at Malton at the hands of Rockingham. He again brought forward his motion for economic reform, which was again rejected, but the fall of North's ministry in 1782 was due entirely to the series of attacks made upon it by B. and Fox. On the formation of the next Rockingham ministry he was not given cabinet rank, but he became paymaster of the forces, an office which he tried to reform. In 1782 he lost his friend and leader Rockingham. The Shelburne administration was overthrown by the unnatural coalition of North and Fox, a coalition which B. approved. He accepted again the office of paymaster of the forces under the Portland ministry and gave his attention to the question of India, he being to a great extent responsible for the drawing up of Fox's India Bill. His acquiescence in the coalition, however, rendered him no service, and after the dissolution he found himself treated with marked contempt by the House, and he was continually received with interruptions and jeers when he rose to speak. The accession of Pitt to power threw great obstacles in his way, but he determined to bring Hastings to book for his alleged misdeeds. At first his chance of success seemed small, but the Opposition took the question up and ultimately the impeachment moved by Fox was accepted by Pitt. In 1788 he began his famous speech on the impeachment, a speech which he concluded with a brilliant peroration; and his labours only ended with Hastings's acquittal in 1795. He was still rejected as a politician even by his party, and even when it seemed likely that his party would come to power his claims for high office were overlooked, and it was again decided to offer him the office of paymaster of the forces. In 1789, on the outbreak of the Fr. Revolution, B. was asked his ideas on the revolution. His answer was practically the *Reflections on the Revolution*, a book which saw nothing but evil in the outbreak of a disordered mob against the rule of law and order. The attack of the 'swinish multitude' could not be reconciled with his love of order, in which alone he saw liberty. His book created a great stir; it gave rise to at least two famous replies, *The Rights of Man* (Paine) and *Vindiciæ Gallicæ* (Mackintosh). It called forth the congratulations of the kingdom, of the king, and of many of the sovereigns of Europe. But it put an end to B.'s love of toleration; henceforth in projected reform he saw only revolution, and he even opposed the repeal of the Test and Corporation Acts. His opinions on the revolution so widely

different from those of his friend Fox, led to the withdrawal of B. from the party he had so long supported, and to a breach of his friendship with Fox. His desertion of his party called down much calumny on his head, but as he himself said, dear as was his friend, the love of his country was dearer still. After his retirement from his party he set himself to lead Whig thought back to the principles of 1688, and pub. his *Appeal from the New to the Old Whigs*. He took little part in parl. life during the next session, and when he did, opposed toleration. During the remaining years he continued to attack what he conceived to be the principles of the revolution; he was still bitterly attacked by both Fox and Sheridan, and it must be owned that on occasion he laid himself open to their sarcasm. In 1795 the impeachment of Hastings ended, and in July of that year B. retired from Parliament. His retirement was made easier for him by the grant of a pension, but the death of his only surviving son just after his election to Parliament in succession to his father broke his heart, and he retired to Beaconsfield, a shattered man. In 1796 he began the publication of the *Letters on a Regicide Peace*, but they were greatly delayed owing to his frequent and increasing illness. In 1797 his illness gradually became worse, and on July 9 he d. It was proposed that he should be buried in Westminster Abbey, but he had preferred the par. graveyard at Beaconsfield, and here he was borne to his last resting-place by members of the 'Whigs whom he had converted to Conservatism.' 'There is but one event, but that is an event for the world—Burke is dead.' See Sir J. Prior, *Memoir of the Life and Character of the Rt. Hon. E. Burke*, 1824; Viscount Morley, *Edmund Burke, an Historical Study*, 1893; Sir H. J. C. Grierson, 'Edmund Burke,' in *Cambridge History of English Literature*, vol. xii, 1914; B. Newman, *Edmund Burke*, 1927; D. C. Bryant, *Edmund Burke and his Literary Friends*, 1939; F. E. Reynolds, *Edmund Burke: Christian Statesman*, 1948.

Burke, Sir John Bernard (1814-92), Brit. genealogist. He was b. in London and received his education here, afterwards in France. His father, John B. (1787-1848), instituted the work which has since been issued annually, called *Burke's Peerage*, besides compiling an *Encyclopædia of Heraldry*. Sir John became Ulster king-of-arms in 1853, and was knighted in the following year. He ed. *Burke's Peerage* till his death, besides producing, among other works, *Anecdotes of the Aristocracy* (1849); *Ficissitudes of Families* (1859-63); and *The Book of Precedence* (1881).

Burke, Robert O'Hara (1820-61), explorer of Australia. A native of Ireland, he was educated in Belgium, and became at the age of twenty a captain in the Austrian Army. He joined the Royal Irish Constabulary in 1848, and in 1853 he sailed to Melbourne, where he became a member of the police. He led an expedition into the interior of Australia in 1860, which

ended tragically. Dissensions caused fatal delays to an expected relief party, and B., with Wills and Gray, two of his companions, perished miserably, only one man, King, surviving to tell the tale.

Burke, William (d. 1798), kinsman of Edmund B., and one of the reputed authors of *Junius's Letters*, travelled with his famous kinsman in 1752, and assisted him in the *Account of the European Settlements in America* (1757). From 1755 to 1758 he was under-secretary of state, and from 1766 to 1774 was M.P. for Great Bedwin. In Parliament he showed, according to Horace Walpole, 'his cousin's presumption,' with 'neither manner nor talents.' In 1769 he was bankrupt as the result of unfortunate speculations. From 1777 to 1792 he spent most of his time in India, having been appointed, in 1782, commissary-general of the forces in the E. Indies. He had already lived with Edmund B. at Queen Anne Street, and at Gregories, and, on his return home in 1793, gladly availed himself of the offer to nurse his broken health at Beaconsfield. As B. had introduced him to the Gerrard Street Club, he is depicted in Goldsmith's *Relation* as 'honest William.'

Burke, William (1792-1829). Irish criminal. Failure in a variety of trades led to his adoption of body-snatching as a livelihood. In co-operation with a man Hare, a lodging-house keeper, he sold the body of a fellow loafer to Dr. Robert Knox of Edinburgh for £7 10s. This was his first attempt. Later the two men perpetrated a series of murders by means of suffocation, afterwards disposing of the bodies to anatomists, chief among them being Dr. Knox. By the time the fifteenth murder had been committed suspicion culminated in their arrest, and on queen's evidence from Hare, B. was hanged in 1829. The slang term 'to burke' signifies the process of suffocation skillfully arranged to leave no signs of violence, and hence to suppress quietly. See W. Roughhead, *Burke and Hare*, 1948.

Burke's Peerage, see under BURKE. SIR JOHN BERNARD and PRECEDENCE.

Burkhan-Budda Mountains are a range of the Kuen-lun system, Tibet, which is largely composed of schists and Archean crystalline rocks, with Paleozoic sediments. It runs in a W.N.W. to E.S.E. direction, keeping between 96° and 98° E. The average elevation is over 16,000 ft., whilst Pryhevalski has an altitude of 17,000 ft.

Burkitt, William (1650-1703), Eng. divine and commentator, b. in Suffolk; educated at Stowmarket and Cambridge grammar schools and at Pembroke Hall. After leaving the univ. he became chaplain of Bildeston Hall; later (c. 1672), rector at Milden; in 1692 vicar of Dedham, Essex; preached against Baptists, 1691; helped Fr. Protestant exiles, 1687-92, and showed great zeal for foreign missions. Among his works are *Argumentative and Practical Discourse on Infant Baptism* (reprinted 1722); *Poor Man's Help and Young Man's Guide* (32nd ed. *Help and Guide to Christian Families*, 1764); *Explanatory Notes on the Four Evangelists*; *Expository Notes*

on New Testament. His works were frequently reprinted and abridged. See Parkhurst's life, 1704; Calamy, *Account*, 1713; Palmer, *Nonconformist Memorial*, 1803.

Burlamaqui, Jean Jacques (1694-1748), Swiss writer on natural law, after travelling in France and England, became prof. of law, and later, when his health gave way, member of the council of state at Geneva. His belief in a rational utilitarianism is expressed in the lucid, unaffected writing of his *Principes du droit naturel* (1747), and his *Principes du droit politique* (1751).

Burleigh, Bennet (ante 1850-1915), Brit. war correspondent, was on the staff of the *Daily Telegraph* from 1882. His early years are wrapped in mystery. He was probably b. in Scotland, for he said he left school in Glasgow during the Amer. Civil war, in which he fought, and in which he was twice sentenced to death. Throughout the Egyptian war he was at the front, at first as the *Central News* correspondent, and then as the representative of the *Daily Telegraph*. Besides accompanying the desert column from Korti to Metemeh (Metemma) in 1884, he went on the Ashanti and Athara expeditions. Finally he was at the front during the S. African, Somali, Russo-Jap., and Balkan wars. Thus in his various publs. he was able to draw on a wide experience, the best of those being *On the Road to Omdurman* (1898).

Burleigh, or Burghley, William Ceoll, Lord (1521-98), was b. on Sept. 13, at Bourne in Lincolnshire. His descent was traced to an Owen of the time of King Harold, and a Sitsylla of the reign of Rufus, but the authenticity of this connection is doubted. William was the eldest son of Richard, a yeoman of the wardrobe, and Jane Heckington. At the age of fourteen he entered St. John's College, Cambridge, where he met Roger Ascham and John Cheke. Here he obtained an unusual mastery of the Gk. language. At the age of twenty-one he married Cheke's sister, by whom he had Thomas, an only child and the destined earl of Exeter. In 1543 Mary Cheke d., and he remarried, three years later, a daughter of Sir Anthony Cooke. It is reported that Roger Ascham placed her with Lady Jane Grey as the two most erudite women in the country. In 1543 he sat in Parliament, and four years later accompanied the Protector Somerset on his Pinkie expedition. About 1548 he became private secretary to Somerset, and shared to a certain extent the anxiety felt by the protector during his fall. He was sent to the Tower in 1549 by order of Somerset's opponents, but in Jan. of the following year was released upon oath. He successfully won Warwick's good graces and presently became one of his secretaries. In 1551 he was knighted. During the changes brought about by the accession of Mary he adopted an accommodating attitude, and by a series of clever dissimulations retained royal favour, though in Mary's Parliament he had no seat. Before Mary's death B. had estab. an intimate understanding with

Elizabeth, and had ingratiated himself so much with her that she reposed in him no small measure of confidence. On her accession, the many pitfalls about her demanded the skill of a man of B.'s stamp, and his experience had left him a master in the art of avoiding, not meeting, danger. In the following years he occupied the positions of master of the court of wards, and chancellor of Cambridge Univ., and throughout his parl. career earned a reputation for honesty of purpose. He was made a peer in 1571. He succeeded the marquess of Winchester as lord high treasurer in the following year. B.'s domestic life was particularly free from the licence that was a feature of the time. See M. A. S. Iime, *The Great Lord Burghley*, 1898; A. Jessopp and others, *William Cecil, Lord Burghley*, 1904.

Burlesque (from It. *burla*, a jest) is applied to writing, acting, speaking, and to drawing, where it is more often called 'caricature.' It consists in distorting or exaggerating a work of art, the object being to excite ridicule. Thus it throws into strong relief peculiarities and affectations and lays stress on all incongruities and oddities, and since it is not malicious, as satire often is, it is used to expose bombast and insincere rhetoric, sham virtues, and all hypocrites, rather than to display in a ludicrous light. Above all, it loves to rouse laughter by discord between subject and style, to make 'gods speak like common men, and common men like gods.' Thus all mock-heroic poetry, such as Butler's inimitable *Hudibras*, Pope's *Rape of the Lock*, and many of the smaller poems of Gray and Cowper, where rabbits and birds and cats are endowed with the sense—and folly—of human beings, are also Bs. What may be styled 'animal' Bs. have been popular from the time of Chaucer; indeed his *Nun's Priest's Tale*, where Chantecler, the cock, and Pertelote, his wife, discuss the value of ominous dreams after the manner of Gk. sages, has never been surpassed. Most people would agree in giving to Aristophanes the highest place among B. writers. Even to-day the splendid fun of his representations of Socrates up in a balloon studying the heavens, or of the demagogue Cleon as a sausage-seller, can be appreciated by every classical student, and how much more monstrous must the B. have appeared to the actual contemporaries of Socrates and Cleon, who could enjoy at once the piquancy of many an allusion lost to-day. The It. word originates in the *Opere burlesche* of Berni, 1497-1535. In France Scarron made a clever mock imitation in his *Virgile travesté*, 1648-53, and throughout Louis XIV.'s reign travesties of the *Iliads* of antiquity were fashionable. In *Don Quixote* the ideals of chivalry are ludicrously misrepresented through the adventures of Don Quixote, the enthusiast, and Sancho Panza, the apostle of common sense, whilst Chaucer in his *Rime of Sir Thopas*, gently scoffs at the interminable and tiresome romances of his day and Racine in his one comedy, *Les Plaideurs*,

burlesques judicial ineptitude. Buckingham's *Rehearsal*, Gay's *Beggars Opera*, Fielding's *Joseph Andrews*, G. B. Shaw's *Androcles and the Lion* and many other plays, Burnand's *Black-eyed Susan*, and the operas of Gilbert and Sullivan, and the Gaiety burlesques may also be cited as illustrations of B.

Burley, city of Cassia co., Idaho, U.S.A. Pop. 4000.

Burlingame, Anson (1820-70), Amer. diplomat. He was a native of New Berlin, New York. He graduated at the Harvard Law School in 1846, and subsequently practised successfully at Boston. His speeches in support of the Free Soil party (*q.v.*) attracted considerable attention. He was a member of the Massachusetts Senate, 1853-54, and of the House of Representatives, 1855-61. His advocacy of Hungary's independence evoked a hostile Austrian attitude to his appointment as minister at Vienna. He was transferred to China by Lincoln, as a result. His activities produced the 'B.' treaty, in which China's right of dominion over all her ter. was acknowledged.

Burlington: 1. City of New Jersey, U.S.A. It is situated on the Delaware R., 18 m. N.E. of Philadelphia. Its pop. is 11,000. The B. Society library, estab. 1757, is one of the oldest in America, and the tn. owes its settlement to Eng. Quakers. In 1677. 2. City of Chittenden co., Vermont, U.S.A. It is placed on the E. coast of Lake Champlain, and is the largest tn. in the state. Its pop. is 27,500. Its situation gives it some popularity as a summer resort. Its manufs. include sashes, doors, blinds, boxes, furniture, woollens, refrigerators, and paper. 3. City of Iowa, U.S.A., is situated on the Mississippi. Pop. 25,750. Good limestone is quarried, while its industries include lumber, furniture, and baskets. 4. City in Alamance co., N. Carolina, U.S.A. Pop. 12,000.

Burlington, in Yorkshire, see BRIDLINGTON.

Burlington, Earls of, see ROYLE.

Burlington House was built on the N. side of Piccadilly, 1665-68. In 1854 the gov. paid £140,000 for the old house, which Richard Boyle, earl of Burlington, had built. The Royal Academy acquired a lease of it and of a garden behind in 1867, and two years later opened exhibition galleries and schools over the garden site. The new building in the It. Renaissance style, erected 1869-72, now provides accommodation for the examining body of London Univ., and for the following societies: Royal, Astronomical, Antiquarian, Linnean, Geological, and Chemical. The Gibson statuary and diploma works are stored in the upper storey, whilst the Royal Academy holds its ann. exhibition and banquet here in premises consisting of thirteen halls, a theatre, and a central octagon, the total cost of which was £150,000.

Burlus Lake, shallow lagoon, 38 m. long, in the N. of the delta of the Nile, Egypt, with which it is connected by canals. One channel also connects it with the Mediterranean.

Burma, republic of S.E. Asia, inaugurated on Jan. 4, 1948, formerly a Brit. dependency, constituting the W. portion of Indo-China, and, until 1937, the largest prov. of Brit. India. It comprised the previously independent kingdom of B., and Brit. B., secured by the wars of 1826 and 1852. It is divided into Upper and Lower B. and the Shan States. Its length from N. to S. is 1200 m., and its greatest breadth 575 m. Its boundaries are, on the N., Tibet; on the E., Chinese Shan States, parts of Yunnan, Indo-China (Fr.), and Siam; S., Siam; W., the

of Bengal. It is navigable for the whole year as far as Bhamo, 900 m. from its delta. The only navigable affluents for large vessels are the Chindwin, the Shweli, and the Myit-nga. The Salween, rising in the snows of Tibet, is navigable for 300 m. during the rainy season and for half that distance in the dry part of the year. The Sittang rises in the hills of Mandalay. Innumerable native craft ply on these rivers and their tributaries during the rainy season, but, save for the largest streams, they are useless for navigation in the dry season. At floods, which are



THE GOLDEN KIUNG (MONASTERY) AT MANDALAY

bay of Bengal and Assam. Its coastline is about 1200 m., and the area 261,600 sq. m. The country comprises chiefly the basin of the Irrawaddy, the area drained by the Salween and Sittang Rs., and the provs. of Arakan and Tenasserim, which are both maritime. With the exception of the deltas of the Irrawaddy, the Salween, and the Sittang, the country is hilly and rugged. Extensive dists. attain a height of 2000 to 4000 ft. The chief mts. are the Patkoi in the N., 12,000 ft.; the China Hills, 15,000 ft., which are snow-capped; the Arakan Yoma Mts.; the Pegu Yoma; and the Tenasserim; while mts. cover the entire ter. of the Shan States. The chief riv. is the great Irrawaddy, whose source is at present undiscovered, but whose known length is 1100 m. It flows from Tibet to the bay

frequent in the wet season, the great rivers spread their waters over a space of 10 to 15 m. from each bank, and only the precaution of building the native huts on piles, and the fortunate circumstance of the slowness of motion, saves the Burmese householders from destruction. Two hundred miles from the sea the Irrawaddy is one mile wide. The climate and rainfall vary considerably in the different parts of the prov. The mean rainfall on the coast is 100 in., while near the Irrawaddy it falls rapidly. At Promé it is only 42 in., and at Thayet-myo scarcely 37 in. The rainfall is particularly heavy on the Upper Chindwin, on the Ruby Mines plateau, and on the Shan Hills. The duration of the wet season at the delta extends sometimes over a period of five to seven months, and though the atmosphere is excessively

moist, the temp. is not extremely hot. Indeed from Nov. to Jan. the temp. sometimes drops to 60° F., but from Feb. to April the delta atmosphere is hot and dry, and the thermometer records frequently 100° in the shade. It is immune from the excessively hot wind that prevails in India, and the nights generally are cool. The fact that, at the Ruby Mines plateau, no higher temp. is registered than 86°, induced the authorities to erect a military sanatorium there. On the whole, the climatic conditions are less easy to endure than those of the plains of India. There is an abundance of useful and valuable trees in the forests of B. The most important type of forest in B. is the mixed deciduous forest, which is at its best along the Pegu Yoma and in the Mu valley of Upper B. These forests contain the timbers of primary importance—teak (*Tectona grandis*), the world's finest general utility timber, pyinkado (*Xylia dolabriformis*), padauk (*Pterocarpus macrocarpus*) which are the source of much the greater part of the forest revenue of the country. Teak trees here are seen sometimes with a girth of 25 ft. and a height of 120 ft. from the ground to the lowest branch. In all the qualities that distinguish a good timber—resistance to shock, strength as a beam, weight freedom from movement—it compares favourably with any of the generally accepted best timbers of the world, though in one particular quality, resistance to shock, it has to give way to ash and hickory and to one Burmese timber, yom (*Auopisau*) (see also TEAK). Next to teak, pyinkado is probably of the next importance in the royalty it pays to the gov. and is of great value as being an extremely heavy and strong timber for railway sleepers and other heavy construction. It is a beautiful tree with a reddish flaky bark and shiny leaves rather like large pea leaves and a flower like an aracia. The tree flowers in the hot weather and emits an agreeable smell. Padauk is a tree whose wood is used for gun-carriages. It has very sweet-scented little orange flowers. Kanyin, one of the big dipterocarps (*Dipterocarpus alatus*), is a very fine tree, with a good timber known as gurlan. Thitya (*Shorea obtusa*), ingyin (*Pentane suavis*), taukkyan (*Terminalia tomentosa*), pyinna (*Lagerstræmia floris-reginæ*) are all timbers of importance not only to the country but to the world. There is in certain places a potentially most important type of forest not mentioned above—the practically pure bamboo forest of the Arakan Yoma. The importance of the bamboo (*Melocanna bambusoides*), called by the Burmese kayinwa, arises from the fact that its non-clumping habit of growth has prevented the successful estab. of any tree species over many hundreds of sq. m. in Arakan and thereby formed very large areas of pure bamboo forest, potentially a source of great quantities of paper pulp. There are also many sq. m. of *Dipterocarpus tuberculatus* forest, corresponding closely to the sal forests of India. The timber is called in Burmese, and is usually combined with that of another dipterocarp,

kanyin. This latter species is extremely resistant to the teredo or marine borer and is therefore of great use when treated for the purpose of wharf piling. Another type of forest peculiar to B. is the Indaing or deciduous dipterocarp forest, normally found in lateritic and sandy soils and seen at its best in the country N. of Mandalay and E. of the Irrawaddy around the mouth of the Shweli R. (see address by D. J. Atkinson, 'Forests and Forestry in Burma,' *Journal of the Royal Society of Arts*, July 2, 1948). The different forest products also include oil, varnish, tannin, gums, and rubber. The teak of the forests is controlled by the State, which pays much attention to the scientific culture of this valuable tree. As much as 350,000 tons of teak have been obtained in a single year. The area of reserved forestry is over 20,000,000 ac. Teak is the prin. export after rice. The wild animals of B. include the elephant, rhinoceros, tapir, buffalo, bison, deer, hog, cattle, tiger, leopard, and bear. There are no horses, and sheep and goats are rarely met. Python and cobras are found in great numbers, while that deadliest of E. reptiles, the hamadryad, is occasionally encountered. An extraordinary profusion of beautiful and varied birds forms a striking feature of the country, and an equal richness marks the fish supply. From the shark to the shrimp, all piscatorial specimens are food for the Burmese. In the caves of the Mergui Archipelago are procured the edible birds' nests which form one of the delicacies of Burmese diet, while turtle eggs are also held in high esteem. The gathering of these eggs is controlled by the State. The mineral deposits of B. comprise gold in riv. sand in small quantities; silver in the Shan States, over 6,000,000 oz. being obtained in 1927; tungsten ore; iron, copper, and lead in large but unworkable quantities; tin in the Mergui dist. In S. Tenasserim; petroleum by the Irrawaddy, of which the output has reached over 250,000,000 gallons in a year; and Arakan oil, an oil which may be used immediately it is obtained from the well; jade and amber are worked, though the former is the more successful; good white marble is quarried at Mandalay, where it is used in the ornaments of Buddhist temples; coal is mined at many places in Upper B., especially at Kale on the R. Chinawin, and at Thingadaw on the Irrawaddy; limestone is procurable, and is burned in large quantities. In Mandalay the finest rubies in the world are found. Agriculture supports nearly 75 per cent of the pop. of B.—16,823,700 (1941). Rice is the prin. crop, the staple food, and chief article of export; other crops are millet, tobacco, cotton, sesame, and ground nuts; some rubber, also, is cultivated. The native pop. is composed chiefly of Burmese, Arakanese, Karens, Shans, Chins, Kachins, and Talings. The non-indigenous elements, of whom there were approximately 887,000 Indians in 1941, Chinese (about 150,000 in 1931), and Europeans, Anglo-Indians, and Anglo-Burmans are an important factor

In the economic life of B. The Burmese people are short and thick-set, and approach the Chinese rather than the Aryan type. They are easy-going, good-natured, and play-loving; the women take part in public life, being keen-witted and excellent traders. The dwellings of the Burmese are almost invariably of wood, generally bamboo. Only the wealthiest members of the race have houses of masonry. Buddhism is their religion, and it is of the purest form. Politically, the Burmese developed extraordinarily during the decade 1920-30, and even then had a wider franchise than any other

from central Asia. The Shans early occupied the country, and later it was peopled by the Taluings. The earliest monarchs in B. were Buddhists from India, and the Burmans first occupied the Irrawaddy valley about 2000 years ago, migrating from central Asia. Settlements by the Fr. and Eng. were not made until early in the seventeenth century, though the Portuguese had occupied parts of the Irrawaddy delta in the fifteenth century. In the eighteenth century Chinese armies invaded the ter. from the N. During the beginning of the last century the Burmese conquered Assam, and in 1820 they met the Eng. Burmese depredations led to a war in 1824, at the conclusion of which the Burmese consented to observe a treaty. But hostilities were renewed in 1852, and Pegu was taken by the Brit. An interval of peace succeeded till 1885, when further violence and insult, under the Burmese King Theobaw, made a fresh expedition necessary. Resistance against the Brit. was half-hearted, and Mandalay surrendered. In 1886 B. was absorbed into the Indian dominion of the Brit. Empire. During the First World War there were instances of unrest, and even rebellion, but disaffection never became general and was comparatively easily suppressed. B. contributed generously towards war expenses, on the other hand, and a large number of men enlisted for service in the army and labour corps. A revolt, nationalistic and economic in origin, broke out in 1930 in Lower B., and spread the following year to Upper B., but was suppressed by some 9000 Brit. and Indian troops and police. In 1923 B. had been constituted a governor's prov. of Brit. India, but in 1937 it became a separate dependency from India, the executive authority being vested in a governor, acting on behalf of the Crown and an advisory council of ministers. Prior to the invasion of B. by the Jap. in 1941 there was a bi-cameral legislature, the Upper House or Senate of thirty-six members being partly elected (from the Lower) and partly nominated by the governor, and a Lower Chamber or House of Representatives of 132 members wholly elected. B. was divided into seven administrative divs. under commissioners, four being in Lower and three in Upper B. The Shan States in the E. of Upper B., the Arakan Hills, and some other dists. were under special administration. In Dec. 1942, the governor, by a proclamation under the Gov. of Burma Act, assumed full executive and legislative powers. Military administration of the areas liberated before the Jap. surrender ceased in Oct. 1945, when full civil gov. was restored. In May 1945 the Brit. Gov. reiterated their considered policy of promoting full self-gov. in B. and their pledge to assist her political gov. until she reached a status equal to that of the Brit. Dominions and of the United Kingdom (Cmd. 6635). In the meantime, pending a general election and the restoration of normal conditions, Parliament approved the continuance, until Dec. 1948, of the proclamation issued



E.N.A.

HEADMAN OF A KACHIN VILLAGE, BURMA

Indian prov., even women in certain cases being permitted a vote. No other Indian prov. approached B., also, with regard to education. A univ. was founded at Rangoon in 1920, and at Insein, near by, is a veterinary school and technical institute; Mandalay has an intermediate college, an agric. college, and a research institute; and at Pyanmana is a forest school. Then besides gov. and locally controlled schools, there are the innumerable Buddhist monasteries, where elementary education is given. Rangoon is the cap. and chief port; and Mandalay, in the centre of the prov., comes next in importance. The chief means of communication are the waterways; there are about 2000 m. of railway and over 10,000 m. of road, metalled and unmetalled.

History.—The original inhab. are believed to have been Austronesian, displaced by successive waves of invaders

in 1942 whereby the administration is carried on by the governor in direct responsibility to the Brit. Gov. The Shan States, until recently, formed a minor administration distinct from that of B., though under the same executive gov. and not subject to the jurisdiction of the Burmese legislature. The Karenni States of Kantarawaddy, Bawlake, and Kyethogyi lying to the S. of the S. Shan States (4200 sq. m., pop. 59,000) were feudatory states, but not part of B. Under the Constitution of the Union of B. (1948) the former federated Shan States and the Wa States are combined as the Shan State; while the former three Karenni States are to be known as the Karenni State. Each of these two states, as well as the Karen State and the Chin, is represented in the Union Gov. by a minister chosen from its own members of Parliament, and enjoys a considerable measure of administrative autonomy. In Britain some held that the pledge given to B. in 1931 that her prospects of constitutional advance would not be prejudiced by her separation from India was amply fulfilled by the large measure of self-gov. conferred by the Act of 1935. But the Burmese themselves interpreted it to mean that their country had the right to advance *pari passu* with India. They resented the discretionary rule of the governor during the preparatory period, the provision that defence and external affairs should remain in his hands, the absence of any admission of B.'s right to leave or to remain within the Brit. Commonwealth, and the plan for an indefinite separation of the frontier regions from the rest of the country. Nationalism, now the driving force of Burmese opinion, was among the consequences of the Jap. invasion, while the creation of a nominally 'independent' B. was the outcome of a resistance movement, a 'patriot army,' and the Anti-Fascist People's Freedom League. The Brit. Gov., however, justifiably proceeded with caution following the expulsion of the Jap. For until the rudiments of an administrative structure could be restored, political advance would have been useless. But unfortunately the impression prevailed that Britain had no real intention of conferring autonomy on the country; and by the time Sir Hubert Rance became governor in the autumn of 1946 there was a dangerous gulf between the administration and the more progressive groups in the country. It was in those circumstances that Mr. Attlee in Dec. 1946 announced Britain's determination to extend to B. the policy adopted for India. Burma (he said) was to be free to choose whether or not to remain inside the Brit. Commonwealth; the executive council in B., as in India, was to carry on day-to-day administration without interference; and the approaching elections were to do duty, as in India, for the constituent assembly as well as for the legislature. In Jan. 1947 a delegation from the Burmese executive council came to London and concluded an agreement with the Cabinet under which the council became the

interim gov. of B. It was also agreed that the common objective of the Brit. Gov. and the Burmese executive council was a free and independent B., whether within or without the Brit. Commonwealth of Nations. The elections for a constituent assembly were held in April, the result being an overwhelming majority for the Anti-Fascist People's Freedom League. The assembly in June resolved that B.'s constitution should be that of an independent sovereign republic, and in the same month a Burmese goodwill mission, under Thakin Nu, president of the assembly, came to London to discuss the question of transfer of power. By a statement made in Parliament by the secretary of state for B. on July 24 the Brit. Gov. agreed to recognise the interim gov. of B. as a full provisional gov. until legislation for the transfer of government was completed. Thus Thakin Nu, the senior member of the interim gov., became by convention the first Prime Minister of B., and his colleagues in the council or Cabinet were henceforth to enjoy the status and powers of ministers. B.'s smooth approach to independence, however, was marred by the assassination a few days previously of no fewer than seven members of the Burmese executive council while in session at Rangoon, the assassins with Sten guns forcing their way into the council chamber and acting evidently at the instigation of the defeated U Saw, chief minister of B. in 1941, who was hanged for the murders in May 1948. The council, however, was at once reconstituted by the governor, Sir Hubert Rance. Among those murdered was U Aung San, only thirty-three years of age, who was one of 'Thirty Crusaders' who underwent military training in Japan. When B. was invaded by the Jap., these comrades were promised, in return for assistance, the reins of civil administration as various districts came into occupation. But they were tricked by the Jap., and Aung San then opened negotiations with the Brit., the upshot of these negotiations being that the Burmese Defence Army rose against the invaders (April 1945). A treaty making B. an independent state outside the Brit. Commonwealth was concluded on Oct. 17, 1947, and its terms were implemented in the Burma Independence Act which was passed by the Brit. Parliament on Dec. 10. The Union of B. came formally into existence on Jan. 4, 1948, and on that day Sir Hubert Rance, the last Brit. governor, handed over authority to Sao Shwe Thaik, the first president of B. The Act brings an end to the suzerainty of the king over the Karenni States, and under the Constitution of B. (passed on Sept. 24, 1947), all the frontier areas came within the federal framework of the union. See also SHAN STATES. See H. Fielding, *The Soul of a People*, 1936; J. Stuart, *Burma through the Centuries*, 1909; F. K. Ward, *In Farthest Burma*, 1921; Sir H. T. White, *Burma*, 1923; Sir G. Scott, *Burma: Handbook of Practical and Commercial Information*, 1924, and *Burma from the Earliest Times to the Present Day*, 1932;

R. T. Kelly, *Burma, 1929*; and B. Laskor, *Problems of South-East Asia, 1944*; J. S. Furnival, *Colonial Policy and Practice: A Comparative Study of Burma and Netherlands India, 1948*.

Burma, Second World War, Campaigns in. The Jap. tide of invasion in 1941-42 soon overwhelmed Burma. The early surrender of Siam gave the Jap. forces a preponderating advantage over the Brit. defences. Very soon the Jap. had cut the Burma Road (*q.v.*) and thereby isolated China. Moulmein was evacuated in Jan. In Feb. Martaban, on the Salween R., was taken, and this was followed by heavy fighting on the Bilin and Sittang Rts. The Brit. forces, consisting chiefly of Indian troops, together with their Chinese allies, then took up defences on the Irrawaddy and Sittang fronts. But Rangoon had to be evacuated in March. Mandalay fell in the early days of May. A considerable part of Burma was thus soon in Jap. hands.

The Battle for Burma.—The resistance offered by Brit., Indian, Chinese, and Burman troops against an enemy whose numbers and equipment gave him the advantage and initiative make an epic of courage and devotion on the part of men of many races but one loyalty. In the early stages all was confusion. When Japan attacked the Brit. Commonwealth and the United States Burma was neither mentally nor materially prepared for war. Her premier, U Saw, was a traitor to the Brit. connection. But it was hoped that Malaya could successfully resist the invader and thereby render Burma immune. Most available troops, aircraft, and equipment were concentrated in Malaya and Singapore. In the whole of Burma, with a frontier bordering on potentially hostile ter. of 1600 m., there was but one diluted Burman div. guarding the long border of the Shan States, while the best part of another div. was spread along the 800 m. of the Tennesseerin from Moulmein to Victoria Point. The Jap. had sev. alternative approaches into Burma on which to concentrate their main drive; the defending forces had to disperse their scanty strength to guard against surprise at each of the approaches. The first serious contact was made E. of Tavoy (Dec.), after which the enemy attacked with a full div. through Siam on the Kawkaireik Pass, which was guarded by an Indian brigade and the 7th Gurkhas.

Meanwhile troops which had put up a splendid resistance at Rangoon against air attacks were compelled to withdraw against combined land and air attack to Moulmein. Indian sappers rendering most effective help. It was then that Burmese 'fifth columnists' began to assist the invader by guiding him through the jungle, while a heavy attack was launched against Moulmein. Out-numbered and attacked on all sides, the garrison fought its way to the jetties and, after inflicting heavy casualties on the enemy, successfully embarked. The problem now was to defend the direct approaches to Rangoon and the rail and roadhead at Martaban, together with the

main crossings over the Salween R. and the low communications back to the Sittang bridge. The Jap. attacked Martaban on Feb. 10 by a coastal landing from Moulmein, but were fought with amazing tenacity by a Gurkha battalion and a battalion of the 10th Baluchis. By now the 17th Div., which had been reinforced by the King's Own Yorkshire Light Infantry, were concentrated behind the Bilin R., whence they fiercely counter-attacked two Jap. divs. The famous 5th Gurkhas of the newly arrived Gurkha Brigade drove the enemy out of Bilin vil. with a celerity which disconcerted the invaders. The defending troops were now getting more effective air support; but although they had inflicted serious casualties on the enemy, they were not sufficiently numerous to thwart a flanking movement, and further withdrawal to Kyaikto was unavoidable. Another Jap. div. was rapidly approaching the Sittang bridge with the object of getting in between the 17th Div. and Rangoon. Thus it was essential to keep the scanty imperial forces in Burma intact, for there were very few reserves. To protect the Sittang bridge were one battalion of the Frontier Force Rifles, the 3rd Burma Rifles, and a company of the Duke of Wellington's Regiment. The bridge was lost and retaken sev. times and the Jap. suffered 2000 casualties. Eventually the bridge was blown up by the Royal Engineers after a most heroic stand by the Duke of Wellington's Regiment and the Gurkhas. The loss of the bridgehead, however, was disastrous and a large part of the 17th Div. was cut off and trapped between two Jap. divs. Most of them fought their way back through the jungle and eventually swam to safety, abandoning all their heavy equipment. Thus the troops had to be re-equipped and reorganised at the very moment when Singapore had fallen and thereby released large Jap. reinforcements. Two Brit. battalions and some units of the Royal Armoured Corps had now reached Burma and the imperial forces were concentrated in new positions in more open country near Peco in the hope of covering Rangoon. Burmese guides, however, helped the invaders, who were cutting the lines of communication from Rangoon to the N. Already, too, the Jap. had won control on the side E. of the bay of Bengal and the cap. had to be abandoned. The Royal Armoured Corps, with the Cameronians and W. Yorks Regiment, fought their way out of the cap. with great gallantry after civil personnel had been evacuated into N. Burma by the Rangoon-Mandalay railway, while the Gloucester Regiment held fast to the city until everything of value to the enemy had been destroyed. The tired and harassed imperial forces now retired towards the semi-isolation of Upper Burma, but, in anticipation of the situation that had now arisen, the Chinese Gov., to whom the link with India through Burma was of vital importance, had dispatched some of their best troops to take over the left flank. But a serious threat developed late in April with the

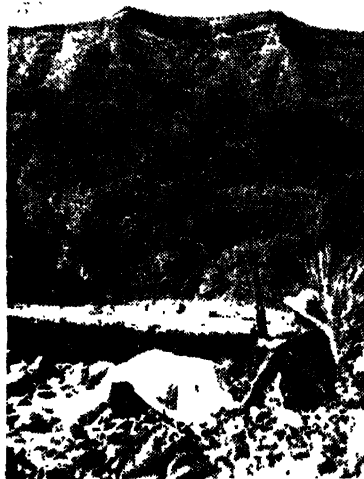
fall of Lashio at the E. end of the famous Burma Road, and with this loss came a direct threat to Mandalay. By the end of the first week of May the Jap. took Mandalay and were able to continue their advance towards the N.E., the N., and the N.W. The Chinese were pushed back along the Burma Road as far as the frontier of their own country by a Jap. armoured force; while another Jap. column pushed into the highlands of the N., towards Myitkyina, with the object of cutting off all communications between China and India through Burma. Brit. and Indian forces, with some Chinese, then withdrew towards the Indian frontier along the Chindwin R. Immediately afterwards the enemy took Akyah, only 50 m. distant from the frontier of India. In this way Burma was lost to the Jap.—a grave misfortune, apart from the danger to India, owing to the possible reactions of the defeat upon Chinese sentiment and the Chinese war effort. For Burma was not only one of the richest countries in the world; it had valuable communications, land frontiers with countries in Jap. occupation, a series of magnificent aerodromes with hard runways, and it was a first-class point of re-entry into E. Asia for the Allies against the time when they would be able to concentrate armies and supplies for their counter-offensive. One, and perhaps the chief, reason for the defeat was that reinforcements for the defence of Rangoon arrived in too small numbers and arrived too late, and the fate of B. was sealed when the city fell in May. At that time there was no suitable road leading into B. from the N.; the roads over the jungle frontiers of India-B. were not in a fit state to sustain the army, and the dropping of supplies from planes was then practically unheard of. As it was, everything required by Gen. Alexander's forces had to be shipped through Rangoon; once that port was threatened allied supplies were abruptly cut off. When Rangoon fell Alexander had but one sensible course remaining, and that was to get out of the country with his army as intact as possible, covering the road to India. This was no easy task for the Allies, who were hopelessly outnumbered, and the Jap. were bent on annihilation. The fall of Rangoon fatally affected the ability of the commander-in-chief, India, to reinforce the defenders of B., and this inability cost the Brit. the Burmese campaign. Earlier circumstances contributed to the defeat. Pre-war preparation for the defence of the country was inadequate for the immensity of the task, and the last-minute transfer of the Burma Command to the India Command left no time for adequate preparations to be made. Moreover, the Brit. forces were insufficiently trained and organised for the kind of fighting they had to undertake; while the Jap., lightly equipped, were well trained for jungle warfare. The B. forces, as a whole, displayed in their resistance a tenacity, stubbornness, and gallantry which had in it a tragic element in view of the inevitability of the outcome. But the mixed Brit., Indian, and Chinese

forces held out for two months, and their delaying rearguard actions prove invaluable to the Allies in the preparations for the defence of Bengal and India generally.

Reversal of the Fighting in Burma during and after the Winter 1942-43.—No further operations of any note took place before the winter of 1942-43, when Brit. and Indian troops fought their way along the length of the Arakan peninsula, and Brig. Wingate raided hostile ter. with his long-range penetration columns. The Arakan campaign was a failure, partly owing to the lack of landing-craft for amphibious operations in support of the troops, and eventually the troops had to retire before the Jap. counter-attacks. But the Jap. were unable to make much impression on the Brit. positions at Maungdaw and Buthidaung and, perforce, spent the monsoon in malarial valleys while the Brit. and Indian troops camped in the comparatively healthy climate of the hills to the N. The 'penetration column' sorties or raids behind the Jap. lines were well conceived and executed. Wingate, who was the leader of the Abyssinian partisans during the reconquest of Abyssinia by the Brit. forces, went to Burma to take charge of guerrilla warfare there, his presence in Burma and the nature of his operations being a well-kept secret until, in May 1943, it transpired that his long-range jungle force, which received its supplies entirely by air, had arrived in India from N. Burma after spending three months as wreckers in the midst of Jap.-controlled country. His brigade, consisting of Brit. and Gurkha columns, with reconnaissance and intelligence detachments from the Burma Rifles, penetrated hundreds of miles across jungle ranges and valleys. The Ra. Chindwin and Irrawaddy were crossed and the Myitkyina railway was cut in a hundred places. Skillfully infiltrating through the chain of enemy outposts and garrisons, the force penetrated enemy ter. as far as the Shan States. Much destruction was done and the enemy was forced to divert troops from the more important and hard-pressed points. (Unfortunately Wingate was killed in an accident in Burma on March 24, 1944, during an operational flight.)

The first offensive, attempted after Lord Wavell (q.v.) was commander-in-chief, was directed towards Akyah. Its success would not have brought the Brit. forces much nearer conquering the rest of Burma, but the small port and its airfield would have been worth capturing to prevent enemy bombers reaching Calcutta from it. But the offensive failed, and a renewed attempt in 1944 under the supreme command of Lord Louis Mountbatten, who had been made commander-in-chief in S.E. Asia, soon came near to disaster; for in Feb. every Jap. soldier in the Arakan that could be spared was mustered for a violent counter-attack. This came in the form of a fierce punch, which drove straight through the front-line positions of the 7th Indian Div. in the Kalapanin valley, and encircled about 10,000 Brit. and Indian administration troops of 15th Corps and 7th Div.

headquarters. It was, however, saved by being supplied from the air and by the capture of Ngakyedauk Pass, linking the Kalapazin valley and the 5th Div. on the W. side of the Mayu range. Mountbatten ordered the 26th Indian Div., who were in the Chittagong area, to the rescue immediately, and after twenty days' bitter fighting the enemy encirclement was



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SUPPLIES BY AIR TO WEST ARAKAN TROOPS IN BURMA

broken. The allied offensive was soon renewed, and the main operation of the campaign fought before the monsoon of 1944 was that which was conducted under the Amer. general, Stilwell, with the object of helping China by building a road through N. Burma to link Assam with the Burma road to Chungking. Opposing Stilwell's line of advance, the chief objective of which was the enemy base of Myitkyina, was the Jap. 18th Div.; but the deep penetration of Wingate's 'Chindits' enabled them to cut the enemy's

communications and so rule out the 18th Div. as an offensive factor against Stilwell. By way of further aid to Stilwell two diversions were conducted, one in Arakan and the other in the Manipur Hills. A force of Amer.-trained Chinese troops under Brig.-Gen. Merrill was also advancing, some 200 m. to the N.E., on a S. course parallel to that of Stilwell's forces. The enemy, however, countered these moves by an advance on the Arakan front with the intention of invading India through Chittagong; and when his forces were utterly defeated by the Brit. Fourteenth Army of seasoned jungle fighters, he attempted to force a passage through Manipur State to Assam, and here he came within measurable distance of success by attacking Kohima and so threatening the vital Brit. road and rail communications through Assam.

Gen. Stilwell actually began his N. offensive from Ledo late in Oct. (1943) and, in the ensuing six months, he led his very fine Amer.-trained Chinese divs., together with U.S. commandos, across the Patkoi Hills and through the Hukawng valley, over 200 m. of most difficult country, to push the Jap. 18th Div. to within 70 m. of Myitkyina, their main base and airfield in N. Burma. Wingate's Chindits (after his death they were commanded by Maj.-Gen. Lemaiguel) co-operated by cutting the supply lines of these Jap. to the S., killing thousands of the enemy and blowing up a dozen stretches of the key railway line to Mandalay and many sections of the Bhamo-Myitkyina road; while a force of Gurkhas and Kachins was advancing on Myitkyina from the N. All these forces, including the Chinese, were supplied by air. Meanwhile columns of the Fourteenth Army crossed the Chindwin R. in support of Stilwell's forces; but were driven back on Imphal, main allied base in the N.E. uplands of India and cap. of Manipur State, and Kohima, the important Brit. base in Assam, where the Jap. attacked strongly, and for some weeks there were fierce attacks and counter-attacks at both places.

At one time early in 1944 the Jap. military occupation of N. Burma seemed to be precarious, but their advance between the Fourteenth Army's forward positions and their base at Imphal relieved their position. Moreover the enemy's counter-attacks in Arakan resulted in the evacuation of Buthidaung, a sacrifice due to the efforts made to help Stilwell's advance. The Jap. command had decided that the proper riposte to Stilwell's thrust was a counter-thrust through Imphal at the allied railway communications rather than direct opposition. The enemy now launched a counter-offensive across the Chindwin R., and a struggle began for the Imphal plain, and for the military roads, constructed since the withdrawal from Burma, that converged upon it. Gen. Slim's Fourteenth Army troops were concentrated to deal with enemy attacks on Kohima. By early April the Brit. and allied forces were in possession of the

whole Imphal plain. But the enemy invaded Assam early in April and the Allies, unable to guard the Manipur road, running parallel to and behind the Burma mt. frontier, for all its course of 200 m., instituted the 'box' system of defence, under which strong points were organised for use later as bases of attack—the same system which had been successfully adopted in Arakan. The Manipur road position was the more difficult to defend from the fact that it was an outlying area dependent on a single line of communications from the railhead on the Assam railway at Dimapur. A week after the initial Jap. entry into Assam, a Jap. column thrust behind the Brit. positions guarding the N.E. approaches to Imphal; while another enemy force threatened Imphal from the S. The whole situation in Assam and Burma was confused owing to the complicated terrain and to the dropping of airborne troops behind the enemy lines. The year had opened with cautious allied thrusts on fronts at Ledo, N.W. of Hukawng valley, Imphal, and Arakan, but since then some four campaigns were superimposed on the strategic field, the Allies and the Jap. each striving to gain some definite advantage before the monsoon season should set in. The allied operations, though offensive in spirit, were essentially preparatory; for entire reliance on a landward approach for the recapture of Burma would be too costly in men and material, seaborne invasion being an essential element in a decisive offensive. The Jap., however, had a great advantage in communications, for they held the Burmese waterways, railways, and roads, the Bangkok-Rangoon railway, and the supply lines into Siam and Indo-China. Against these, the Allies had their troop-carrier command—which had shown its value in relieving the Indians in Arakan and in carrying commando troops behind the enemy lines further N. (see above)—combined with the air supremacy maintained by tactical, strategical, and reconnaissance air forces.

The position in mid May (1944) was that Gen. Slim's Fourteenth Army held a line in the W. of Manipur state, before Imphal, with the Jap. line extending in an arc from near Kohima, round the E. part of Manipur state, to Tiddim. Far to the N.E. was Stilwell's Chinese army advancing on Myitkyina, with a Jap. div. near Mogaung between Stilwell and the Brit. airborne troops located on the Bhamo-Myitkyina road south of this enemy div. and in rear of the Jap. defending or counter-attacking near Imphal. The enemy, however, in attacking Slim's positions in Manipur, suffered disproportionately heavy losses and were now generally on the defensive. A forty days' pitched battle for Kohima ridge ended in the middle of May when the position fell to the Brit. forces, the enemy losing over 3000 dead, while Brit. casualties were not light. The main aerodrome at Myitkyina was captured by Merrill's force as the successful outcome of a daring march through rough and tortuous terrain in the mt. jungles of N. Burma to the

Mogaung valley. It was a fitting climax to operations which were part of a co-ordinated plan to the origin of which so much was owed to Gen. Wingate. While three enemy divs. were still knocking their heads against the wall in Manipur, the whole of the Jap. communications in N. Burma were now in jeopardy; besides which the allied jungle columns had now acquired habitable quarters against the monsoon rains. Soon afterwards Merrill's forces, with reinforcements of airborne troops from Stilwell, penetrated the outskirts of the tn. of Myitkyina (May 19).

The land fighting over the scattered Indo-Burmese fronts did not altogether cease with the monsoon, though the rains made new campaigns impossible. Gen. Stilwell had made valuable gains in N. Burma and allied air supremacy was further emphasised; but, on the whole, the pre-monsoon campaigns had been rather disappointing, especially on the Arakan front, which had now become a purely holding campaign to prevent Jap. incursions into Bengal. Moreover the transfer of troops to Imphal eliminated any large-scale offensive in Arakan, where the monsoon, if anything, favoured the Allies, though neither side could expect to make important gains. But at least the dangers to Imphal and Kohima, so acute in March-April, had passed, though all fighting remained on the Indian soil of Manipur state, and it was a question how far back towards their Chindwin R. bases the Jap. could be pushed with weather conditions steadily growing worse. Myitkyina, however, did not fall after the brilliant capture of its airfield, but there seemed to yawns the end of June to be no doubt that it would soon be captured, provided it could be done without undue loss of life against long-prepared Jap. fortifications. The campaign here, however, had been fundamentally successful and, with the aid of the Chindits, had brought the season's only real gains. Other appreciable gains in this part of the country were the freeing of the Imphal-Kohima road, which resulted in the opening to the Allies of the vital Dimapur-Imphal road; and the capture of Mogaung by Chinese troops and units of Gen. Leutalagne's force, which comprised elements of Gurkha and Brit. county regiments (June 25).

The Road to Mandalay.—Chinese and Amer. troops had entered Myitkyina on May 18, but so fierce was the Jap. resistance that it was not until Aug. 3 that their garrison was destroyed. The capture of this great base was a triumph for Stilwell's Amer. and Chinese troops and for the Brit. penetration groups operating in the Jap. rear. Allied losses were light, but scarcely one Jap. soldier remained alive in the tn. The capture of Myitkyina increased the protection of the air routes to Chungking—the remarkable ferry service 'over the hump' of the Himalayas which was now transporting a great tonnage of supplies.

The victory won in Burma, notably by the magnificent defensive battle of Manipur, to which battle-ground the Jap.

were skilfully enticed with consequently enormously increased difficulties of communications, was scarcely realised at this time by the world which was preoccupied with the Homeric encounters in Europe. But if events had moved slowly in Burma the result of this defence was that by the beginning of 1945 more than a quarter of Burma had been liberated and the spearhead of the Fourteenth Army was only some 20 m. from Mandalay.

Gen. Slim's tactics in the battle of Manipur were essentially those of Wellington at Waterloo—the isolated defensive areas attacked on all sides by the Jap. being substituted for the isolated and always unbroken squares of Waterloo. The Jap. broke off the battle in July, retiring in disorder and dying of starvation and disease. It was vital that they should be given no chance to reorganise and make a stand on the Chindwin R. But the weather was terrible and roads were completely destroyed, while the Brit. and Indian soldiers were weary after their hard fighting during the monsoon. Yet they did not halt and in consequence Gen. Slim's army had, later, a much easier task than if they had delayed until Oct. before advancing on the Chindwin. The enemy were retiring by two main routes—the Tiddim road and the Kabaw valley, both running N. and S. Down the Tiddim Gen. Slim sent the 5th Indian Div. with orders to destroy the remains of the Jap. 31st Div. and get through to Kalemyo, and the manner in which this div. carried out its orders is one of the great stories of the war. With the monsoon at its height, amid mts. twice as high as Ben Nevis, with only a single narrow tortuous road to move along, the Indians never faltered. Kennedy Peak and Port White are battle honours which will rank with other names in the div.'s hist. like Keren and Amba Alagi. Down the Kabaw valley went the 11th E. African Div. (see KING'S AFRICAN RIFLES), which was new to campaigning outside Africa. Plunging through the jungle over roads a foot deep in mud, they never lost touch with the Jap., and finally joined up with the 5th Indian Div. at Kalemyo, forced their way through the gorge to Kalewa, took it, and were on the Chindwin. Thus by superb fighting Gen. Slim's forces had reached the riv., the enemy had no time to re-form, and there were fully five months to elapse before the monsoon would start once more.

While this was happening, Gen. Sultan—who had succeeded Gen. Stilwell—was pushing down from N. Burma. His 36th Brit. Div., having left Mogaung, was held up for some time short of the railway junction at Naba but had now resumed its southward march, relying solely on the air for its supplies. Further E. the Chinese 38th Div. had moved S. from Myitkyina, surrounded Bhamo, and pushed on, also in the direction of Mandalay. Bhamo fell on Dec. 15 after a month's siege. Of its few buildings still standing when the Chinese entered all were damaged.

Capture of Katha on the Irrawaddy—Fall

of Akyab.—It was at the end of Nov. that the campaign had taken a sudden change. The Fourteenth Army crossed the Chindwin and was committed to the daring manoeuvre of taking Mandalay from the N., an operation previously considered impossible owing to the poverty of communications. But the crossing of the Chindwin had an immediate result. Resistance crumbled before the 36th Div., which then captured Katha, the chief enemy base on the R. Irrawaddy. The speed of the advance increased on all fronts. The Indian corps swept over the mts. on the E. bank of the Chindwin, reached the railway, and joined up with the 36th Div. Ye-u and Shwebo were soon taken. The advancing forces now stood but 20 m. from Mandalay.

During these events in N. Burma Akyab in the far S., the chief Jap. base in Arakan, fell without a battle, though an elaborate small-scale amphibious operation had been planned. Air reconnaissance found only derelict defences. The capture of this, the third seaport of Burma, undoubtedly had some prestige value, but its strategic importance was not great, though it gave the Allies an advanced air-base. A poor port, it did not give what they urgently required—a way into central B. from the coast. Almost simultaneously Gen. Christison's amphibious forces landed at Myebon to get in the rear of the Jap. trying to escape southwards.

Fresh advances on Mandalay and Sagaing, two of the main enemy bases on the Burma front, began in mid Jan., following a terrific concentration of bombs dropped by the R.A.F. on military installations and troop formations in Mandalay. Indian troops from Nepal had struggled through 500 m. of Burmese jungle to reach the open country in front of Mandalay.

Ledo Road to China opened.—Thus, during Jan. the war in Burma went well for Adm. Mountbatten's forces, though it was evident that the battle for Mandalay would be a hard one. The outstanding event of the month, however, was the opening of the Ledo road to China. The Jap. cut the old Burma road, on which China was wholly dependent for war material, early in 1942. Towards the end of that year the Allies began the construction of a new road from Ledo, the railhead on the mountainous E. frontier of Assam. It was a vast undertaking, involving road construction over 300 m. of the most difficult country in the world, between Ledo and Myitkyina on the Irrawaddy; but it was accomplished by Brit., Amer., and Indian engineers with the help of African, Indian, and Chinese troops and labourers, and the new road was now open right through. Meanwhile the 26th Indian Div. of the 15th Corps were engaged in successful amphibious operations against Ramree Is. (Jan. 21). This was followed shortly after by a landing on Cheduba Is. by Royal Marines. Operations in the Arakan had been locking up four allied divs.; Gen. Sir Oliver Leese, commander-in-chief allied

land forces, saw a way of amending this by staging a series of landings in the enemy's rear along the Arakan coast while exerting pressure from the N. Further landings at Myebon, Kangaw, Ru-Ywa, and Letpan followed, in which Commandos, infantrymen, tank crews, gunners, and naval and air forces all played a gallant part, and started a full-scale Jap. retreat southwards. Thus was achieved the second of Leese's aims—the release of the Arakan forces for other operations. The bloodiest battle of the whole war in Burma was now being fought at Kangaw (or Gangaw) in Arakan, where for three weeks thousands of Jap. had been trying to break southwards—their only road to safety—through the road block formed by the 15th Indian Corps. On Jan. 22 (1944) Brit. and Indian troops entered the large tn. of Monywa on the Chindwin R., 60 m. W. of Mandalay. The Jap., who were in strong stone-bunkered positions, included men of the 33rd Div., which had an estab. reputation for never yielding a position until physically compelled to do so. But Thunderbolts and rocket-firing Hurricanes accurately pin-pointed the enemy's positions and destroyed them, and infantry of the 14th Div. then took the tn. without meeting any further resistance. But the crucial point of the approach battles for Mandalay was 60 m. N. of the city, where Brit. and Indian troops held strong bridge-heads on the Irrawaddy in face of fanatically directed counter-attacks. These bridge-heads were the only point near Mandalay where the Brit. troops were on the same side of the riv. as the city; hence the fury of the Jap. resistance. Fourteenth Army troops, however, had full control of the N. bank of the Irrawaddy from Sagaing hills to where the Chindwin flows into the Irrawaddy and were as close as 17 m. to Mandalay. Fourteenth Army troops made a descent on the Irrawaddy, 110 m. S.W. of Mandalay, early in Feb., which brought them to the N. edge of the B. oilfields. Mid Feb. still saw the enemy fighting hard round Mandalay, but they were being steadily pressed back.

Battle for the Burma Oilfields—Mandalay Battle opens.—Fourteenth Army troops, on Feb. 14 (1945), crossed the Irrawaddy near the famous ant. city of Pagan (q.v.) which they seized. Here the riv. is more than a mile wide, being swollen by the waters of the Chindwin, and near the far bank the Brit. troops came under murderous fire from machine-gun nests in the caves and tunnels of the cliffs, which wrought great havoc until Thunderbolts and Mustangs were sent up to silence them. This gave the Allies a new bridge-head 4 m. deep, N. of Chauk, the second biggest oil-producing tn. of Burma. The battle for the great Burma oilfields was now beginning. The crossing of the formidable riv. barrier and the forcing of the enemy to conform to the Allied plan had been achieved and the real battle for Mandalay was on the point of opening. But the line of the Pagan force was fantastically

bad and most of the supplies had to be carried by air. It was a campaign for study by future students of military hist., in which the seemingly impossible was accomplished, the bringing to its logical sequel of the brilliant experimental work of Wingate's Chindits. In a surprise armoured thrust of 85 m., supported by airborne forces, the Fourteenth Army, striking E. from the Pagan bridge-head, virtually cut off the Jap. army of 40,000 defending the Mandalay area. In this thrust, after a five days' struggle, they captured Meiktila, the second largest tn. of central Burma, with eight airfields. Driving still further E. they took Thazi, and thereby captured the road and railway junction from Mandalay to Rangoon, leaving the enemy only an escape route over the difficult Shan hill country. The Jap., expecting a drive to the rich oilfields to the S., had ignored the desert country to the E., and though they made a 'suicide' stand in the streets of Meiktila, at least 1200 were killed. An armoured column of the 19th Indian (Dagger) Div. swept through the city limits of Mandalay on March 8 and were soon only a mile from Fort Dufferin, the centre of the city. The walls of the city were pierced by men of the 15th Punjab, while other Punjabis stormed Mandalay Hill, the pagoda-covered landmark in the N. section of the city. Other forces of the div. were now fighting below Madaya, 13 m. N. of Mandalay, on the southward route from the Singu bridge-head E. of Shwebo. To the N.E. of Mandalay Lashio and its main airfield were captured by the Chinese First Army. Thus the whole Burma road from Lashio to Kunming had now been cleared, for Gen. Sultan's forces had advanced sufficiently far S. to protect the new overland supply route—the Stilwell road—opened six weeks ago.

The struggle for Fort Dufferin was long and bitter in the extreme. On March 10 Indian troops made a gallant but unsuccessful attempt to penetrate it. This fort is really the site of the old palace and inner city of the last Burmese kings, and it was named after the viceroy at the time of the annexation of Burma. The fort is a square with sides over a mile long, right in the middle of Mandalay, and it is surrounded by a rampart 30 ft. high of massive earthwork strengthened with rocks and faced with red brick. Outside the rampart is a moat 70 yds. wide, and there are five bridges leading into as many gateways in the wall.

Fall of Fort Dufferin—Triumph of Aerial Transport.—The occupation of Maymyo on the main road and railway between Mandalay and Lashio by Indian troops was another blow to the Jap. in central Burma. In peacetime it was Burma's most popular hill station and was the summer seat of the gov. When forced to evacuate in 1942, Gen. (later F.M.) Alexander moved his headquarters there. Since the Jap. occupation it had been the headquarters of various Jap. military formations. Its capture sealed off Jap. routes from central

Burma into the Shan States and Siam. Other troops of the 19th Indian Div., fighting from pagoda to pagoda through the anct. city of Mandalay, were now meeting stronger opposition, chiefly because the Jap. were trying to get their supplies out of Mandalay and so fought hard to preserve the entrance to Fort Dufferin. The religious buildings on Mandalay Hill had suffered great destruction, but their exteriors were not badly damaged. On March 19, however, King Theebaw's palace went up in flames, despite Brit. efforts to preserve the famous monument with its spire of seven tiers. The Jap. were seen using a wooden building near the palace as an observation post. This post was shelled and destroyed and the wind blew the flames across the dry grass to the hmsy palace. On the same date Eng. and Scottish troops occupied Ava, the old cap. of Burma, opposite Sagaing on the Irrawaddy. Brit. troops also took Amarapura ('the immortal city'), yet another of the anct. caps. of Burma and rich in historical monuments, lying 6 m. S. of Mandalay. Fort Dufferin fell at last on March 20 to the 19th Indian Div. Thus fell Mandalay, second city of Burma, and its fall was an indication of the great progress made by the Allies in the liberation of the country. The campaign leading to this victory had involved great feats of military engineering and marching over what were, perhaps, the most difficult lines of communication in any theatre of war. The crossing of the Irrawaddy alone, at points where it is six times as wide as the Thames at Waterloo Bridge, was an epic achievement. All these great land advances were only made possible by the untiring efforts of the Brit. and Amer. airmen. In one year the 33rd Indian Corps under Lt.-Gen. Sir Montagu Stenford, from the time of the relief of Kohima and Imphal, cleared the enemy from 32,000 sq. m. of India and Burma, killed 20,000 Jap., and captured 251 guns. A vital factor in the success of the Allies in the Burmese campaign was the use of air transport, especially from the time when the campaign reopened in the autumn of 1943. Great experience had been gained in aerial transport, and the arrival of more transport squadrons allowed of much extended operations. The large-scale use of air supply in the Arakan operations was the turning-point in the war in Burma. So long as the allied forces stood their ground instead of trying to fight their way back past the road-blocks erected by the Jap. to cut them off, the supply problem of the enemy remained insoluble. Although the Jap. fought tenaciously without reinforcements of munitions, their fate was sealed. When the second Wingate expedition set out, its operations depended entirely on the weapon which had then recently thwarted the Jap. in the Arakan battle, namely air supply; and not merely did the allied troops establish themselves in the middle of enemy-occupied ter. but they built improvised landing-grounds for the reception of supplies, and it was during that campaign that gliders were so suc-

cessfully used to carry equipment. The climax of the campaign was the assault on Myitkyn, in which Gen. Stilwell used transport aircraft in a series of permanent advances in which forward landing-grounds were rapidly built to forestall all enemy counter attacks.

With the occupation of Chank (April 18), Magwe (April 19), and Yenauyaung (April 21) the capture of the Burma oilfields was complete. Yenauyaung was the main centre of production, and until this time that place had had the heaviest concentration of Jap. anti-aircraft guns in all Burma.

British capture Rangoon.—Battle of Burma ended.—Toungoo, 165 m. N. of Rangoon, and its three airfields were captured on April 26 by the Fourteenth Army, which had advanced 50 m. in a week. Dakotas with Amer. engineers were flown in with all the supplies needed to enable the columns to move forward with renewed impetus towards Rangoon. The dash of Brit. and Indian mechanised columns into Toungoo took the enemy completely by surprise and they fled precipitately to the foothills near by. Four days later the advancing columns had reached Pegu, junction of the railway to Siam, and were therefore through the last natural defensive position held by the Jap. before Rangoon, a defile through which runs the trunk road and railway. The powerful armoured columns were unable to deploy here and the defile was forced by the infantry. For some days past the enemy had been evacuating Rangoon. They fought well on the whole, and many suicide attacks were made on the tanks by men running up with magnetic mines, but mostly the Jap., armed only with rifle or machine-gun, were terrified of the tanks. The Jap.-sponsored army of Burma was now co-operating actively with the Fourteenth Army. The tables were turned on the Jap., who now found themselves in a hostile country with every man's hand against them. Pegu was attacked on May 1. A heavy barrage was laid down on the vil. by nearly 100 guns. Men of the W. Yorkshire and Border Regiments, with Punjabis, then mopped up the enemy holding force, which in fact consisted of the remnants of the evacuated Rangoon garrison. The last road usable by motor transport and the last railway by which the enemy in Lower Burma could escape to the E. were now denied them. The next task was to bridge the broad Pegu R. This accomplished, the armoured columns were soon thundering down towards Rangoon in a race as much against the approaching monsoon as against the Jap. After bomber raids on the Jap. defences, Brit. paratroops landed on May 1 S. of Rangoon, followed the next day by forces landed from Brit. ships on both banks of the Rangoon R. S. of the city. Any Jap. troops in the Rangoon area were thus trapped between two allied forces who were now carrying out a pincer movement, while other troops of the Fourteenth Army were fast moving on the rap. from the N. Troops of the allied land

forces entered Rangoon on May 2. The fate of the Jap. still resisting in W. Burma was sealed with this entry and with the capture of Prome on the Irrawaddy. 180 m. N. of Rangoon, which latter capture cut the escape route of the enemy into the Arakan area. So fell Rangoon. In a series of battles of great intensity over the previous fifteen months the Jap. armies in Burma had been so decisively defeated that they were unable effectively to defend Rangoon. Ninety-seven thousand of their dead were counted over that period, and their total casualties were 250,000. Allied total casualties, including Chinese, were not half this total. The fall of Rangoon, ten days before the monsoon broke, brought to an end the battle of Burma. For although pockets of enemy resistance remained their doom was certain. The occupation of the cap. by a combined operation was the culmination of a long series of concerted operations carried out by the Fourteenth Army, which crossed the Chindwin and Irrawaddy Rs. to break into central Burma; by the Amer. and Chinese forces of the N. area command which advanced from the N. to Lashio; and by the 15th Indian Corps which carried out a series of amphibious hooks down the Burma coast. All these operations were supported and supplied by air on a scale never attempted theretofore in any theatre of war.

Jap. forces E. of the Mandalay-Rangoon railway were now hastening their retreat over the Shan Hills to Siam, but were being constantly pounded by Brit. aircraft. Other Jap. remnants were being driven southward along the banks of the Irrawaddy by two Brit. columns which were seeking to trap them in S.W. Burma before the monsoon broke. Although from the strategical point of view the issue of the Burmese campaign had been settled, a large area of the country still remained to be cleared of the enemy. This area included the Shan Hills and the Salween R. basin, the S. part of the Arakan coast, and the area of the Pegu Hills between the old Burma road and the lower Irrawaddy valley. 'Mopping-up' operations, which had been intensified daily since the reoccupation of Rangoon, almost constituted a campaign in themselves, for there remained some 60,000 Jap. troops to be driven out of the country, of which over 40,000 were in the E. sector E. of the Mandalay-Rangoon railway, and some 15,000 W. of the Rangoon-Meiktila road. These were trying to avoid action and seeking to filter eastward by night in small bodies.

Japanese Forces marooned.—Gradually these forces were reduced, but in a country of such great distances, such difficult terrain, and during the monsoon it was not possible to drive the Jap. into restricted areas and annihilate them. To the N.E. of Mandalay they had been driven well back into the hills where they had next to no guns and but little equipment. Their line of communication was across the Salween into N. Siam, a long and difficult route, but the Jap. left their men to die, with orders to kill as many of the

allied forces as possible before being killed. In the S. the situation was different. Here the obvious land route of advance was from Pegu across the Sittang, Irlin, and Salween Rts. to Moulmein. Holding the line of the Sittang were the remnants of the Jap. armies from central Burma, very short of transport and with only a few mt. guns, but nevertheless a considerable obstacle. The Brit. Twelfth Army held the line of the road and railway from Rangoon to Mandalay. W. of this line was a force of about 10,000 Jap. cut off in the Pegu Yomas and made up of the remnants of the Jap. Twenty-eighth Army, with elements of the 54th and 55th Divs. The Jap. in the Yomas were trying to force a way back across the corridor, while their comrades on the Sittang tried to open a way for their escape. In this fighting the Gurkhas had a hard task to defend themselves—a reminder that even if the enemy had been driven out of most of Burma, the war in that country was not over. But by July 27 the Jap. had lost more than 5000 men in their desperate effort to break through the allied lines and across the Sittang into Siam.

Japanese Surrender in Burma.—The war with Japan, however, ended abruptly in mid Aug., following the dropping of atomic bombs on the Jap. homeland (see PACIFIC CAMPAIGNS IN SECOND WORLD WAR). It only remained for envoys to reach the various allied headquarters to sign instruments of surrender, a process delayed by distances, especially in Burma, where fighting went on in the Karen Hills despite the general surrender of Aug. 14. But acting on Adm. Mountbatten's orders Jap. representatives signed a preliminary agreement at Rangoon on Aug. 27 in order to enable relief to reach prisoners of war quickly and to facilitate the reoccupation of S.E. Asia when the general instrument of surrender was signed in Tokyo on Sept. 2. The final instrument for the surrender of Burma to the Brit. Twelfth Army was signed at Gov. House, Rangoon, on Sept. 13 by Jap. envoys acting in the name of F.-M. Count Terauchi, supreme Jap. commander of the S. armies. This ended the war in Burma, with a surrender signed, appropriately enough, in the building where Ba Maw's puppet gov. had treacherously declared war on Britain two years previously (Aug. 1, 1943). See *The Campaign in Burma* (H.M.S.O.), 1946; R. McKelvie, *The War in Burma*, 1948; A. Brett-James, *Report my Signals*, 1948.

Burma, or Burma-Yunnan, Road, runs between Lashio, N. end of the Burmese railway from Rangoon, and Chungking, Chiang Kai-shek's cap. in 1939-40. It was constructed between 1936 and 1938, after the Sino-Jap. war had been in progress for some time, with the object of providing the Chinese armies with an alternative route for supplies to that from the sea, which had been cut off by the Jap. advance southward. The chief use made

of the road was as a means of transport for Russian munitions to China and, in July 1940, the Brit. Gov., in view of its difficult position from the collapse of France, felt compelled to agree to suspend temporarily the transit of war material and certain other goods via Burma. To have agreed to permanent closure of the road would have been to default from obligations as a friendly neutral power to China. But the closing of the road for even three months was criticised in Britain as involving an example of the much-derided policy of appeasement, and it was with a sense of relief that the Brit. people learned that the road had been duly reopened after the expiry of the three months on Oct. 17.

Burma Star, decoration instituted in 1945 for service in the Burmese campaign beginning Dec. 11, 1941, until the end of the campaign. The ribbon is dark blue, with a central red stripe and in addition two orange stripes. A candidate who qualifies for both the B. S. and the Pacific Star is awarded the star first earned.

Burmans, Pieter (1668-1741), famous Dutch classical scholar, usually known as the elder to distinguish him from his equally famous nephew. He was b. at Utrecht, and commenced his studies at the univ. there. He was intended for the legal profession, but later became prof. of hist. and eloquence at the univ. of Utrecht. Next he became prof. of Gk. language and eloquence at Leyden, and finally prof. of hist. for the United Provs. and chief librarian. He was famous throughout Europe for his commentaries and eds. of the classics, and he took part in a number of the disputes which were waged between the men of letters of the period. Amongst his more important publs. may be mentioned eds. of Phædrus (1698), Horace (1699), Justin (1722), Ovid (1727), Suetonius (1736), and Lucan (1740).

Burmans, Pieter (1714-78), nephew of the above, b. at Amsterdam. He studied under his uncle at Leyden, and made a special study of law and philology. He became prof. of hist. and philology at the univ. of Amsterdam. He pub. many eds. of classics, together with an anthology of the Lat. epigrammatists, 1759-73. Authors ed. by him include Virgil (1746), Claudian (1760), Propertius (1780), and Aristophanes (1760).

Burmanniaceæ is a small order of monocotyledonous plants found in tropical forests. The flowers are bright blue, and the plant is a saprophyte. The chief genus is *Burmannia*, of which there are some thirty species.

Burn, Richard (1709-85), Eng. legal writer, b. in Westmorland and educated at Queen's College, Oxford. He took holy orders and became vicar of Orton. But he devoted his life to a study of law. He was made chancellor of the diocese of Carlisle. His two most famous works were *The Justice of the Peace and Parish Officer* and *Ecclesiastical Law*, which was regarded as the standard authority on that subject for a great many years.

Burn, William (1789-1870), Scottish architect, native of Edinburgh. He was educated for his profession under Smirke. He was successful in Edinburgh and London, where he settled in 1844. He has left examples of his work in all parts of the country.

Burnaby, Frederick Gustavus (1842-85), Eng. traveller and soldier. The son of a clergyman, he was educated at Harrow, and entered the Royal Horse Guards in 1859. He acted as Carlist correspondent of *The Times* in 1874, and later went to Khartoum to investigate and report upon Gordon's expedition. He achieved fame through the travelling feat of crossing Russian Asia on horseback, which is described in his *A Ride to Khiva*. His love of excitement found vent in a series of balloon ascents, in one of which he crossed the Channel. Later he was wounded in action at El Teb in 1884. He d. fighting at Abu Klea.

Burnand, Sir Francis Cowley (1836-1917), Eng. humorist, was b. in London. His mother, Emma Cowley, was descended from the author, Hannah Cowley. Educated at Eton and Cambridge. He adopted law as a profession, though he had formerly studied first for the Anglican, afterwards for the Catholic, Church. He founded the Amateur Dramatic Club at Cambridge and made dramatic writing his work. *Black-eyed Susan* (1866), a burlesque, made a great hit. He succeeded Tom Taylor as editor of *Punch*, from 1880 to 1906. He pub. *Happy Thoughts* (1868), many other popular books, and an autobiography, *Records and Reminiscences* (1904).

Burne, Sir Owen Tudor (1837-1909), Eng. soldier, was drafted in 1856 to India with his regiment, the Lancashire Fusiliers, the mutiny having broken out. Owing to his knowledge of Hindustani, he was soon appointed brigade-major. At the assault of Kaisar Bagh he led the attacking column. Sir Hugh Rose, impressed with his work as adjutant, appointed him private secretary in 1862, and he held a similar position under Lord Mayo in 1868, and under the viceroy, Lord Lytton, 1876-78. F. was with the former when he was murdered in the Andaman Is.

Burne-Jones, Sir Edward Burne, Bart. (1833-98), Eng. painter, b. at Birmingham on Aug. 28. He was an only son, and of Welsh extraction, and the idealism of his character and his art has been attributed to this Celtic strain. He was educated at King Edward's School, Birmingham, and studied for the Church. His interest in classical studies was life-long, but it was classical mythology that chiefly attracted him. In Jan. 1853 he entered Exeter College, Oxford. Here he met Wm. Morris, who had joined the house on the same day, and the couple became fast friends. The two friends soon discovered their true bent, and relinquishing the Church, they devoted themselves to art. B. took Rossetti for his master, though he had not yet met that artist; in 1856, however, his dream was realised, and his acquaintance with Rossetti began. He left

college, and settled in London, and commenced his studies under the instruction of Rossetti. Morris soon joined him here. So apt a pupil did B. become, that by the end of the same year Rossetti was compelled to admit though without acrimony, that he was no longer able to teach the young artist more. Many branches of work were undertaken by the young man, among them being pen-and-ink work on vellum, oils, and cartoons for stained glass. In 1858 his deep admiration for Chaucer led him to execute a cabinet decorated with scenes from 'The Prioress's Tale.' His first journey to Italy was made in the following year, and in 1860 he executed two water-colours which show most strongly Rossetti's influence, and which rival, in a greater degree than that yet reached, that master's work. These works were 'Sidonie von Bork' and 'Clara von Bork.' He married Miss Georgiana Macdonald in the same year, and in 1862 the couple accompanied Ruskin on his tour to Milan and Venice. In 1864 he was elected an associate of the Society of Painters in Water Colours. He became A.R.A. in 1886, and in 1894 he was made a baronet. An attack of influenza resulted in his death on June 17, 1898. Among his masterpieces are 'King Cophetua and the Beggar Maid,' 'The Golden Stairs,' 'Pan and Psyche,' 'Chant d'Amour,' and 'The Annunciation.' B.'s influence has shown itself far less in painting than in the sphere of decorative design. Here it has been very marked indeed, particularly in designs for stained glass. Specimens of these executed from his cartoons are to be found all over the country. See M. Bell, *Sir Edward Burne-Jones*, 1892; A. Valsecchi, *The Decorative Art of Burne-Jones*, 1900; Lady Burne-Jones, *Memorials of E. Burne-Jones*, 1904.

Burnell, Arthur Coke (1840-82), Sanskrit scholar, went out to Madras in 1860. All his free time was devoted to Sanskrit, and in 1870 he generously gave his collection of 350 MSS. to the India Library. Of his *Handbook of South Indian Palaeography* (1874), Max Müller remarked: 'It opens an avenue through the thickest and darkest jungles of Indian archaeology.' But his chief work was his *Classified Index to the Sanskrit MSS. in the Palace at Tanjore* (1880). It is a compendium of the Sanskrit literature of S. India. Overwork and the hardships of the Madras climate were responsible for his early death.

Burnes, Sir Alexander (1805-41), Brit. soldier, traveller, and explorer. He was b. at Montrose, and at an early age entered the service of the E. India Company. He proposed the exploration of the N.W. Provs., which at that time were practically unknown, and in 1831 went to Lahore on a special mission. In the following year he started on the tour which took him across the Hindu Kush, to Bokhara and Persia. The book which he pub. on his return to England obtained for him the recognition of the Brit. and Fr. geographical societies. On his return to India he went on a special mission to Kabul, and was later political agent there.

He was assassinated by the Afghan mob in 1841, meeting his death bravely. His publications were *Travels into Bokhara* (1834) and *Cabool* (1842).

Burnet is the name given to various species of *Poterium*, a genus of Rosaceae found in N. climates. *P. Sanguisorba*, the salad B., is a unisexual plant with an indefinite number of long stamens; the flowers, situated at the top of the spike, are female, those below are hermaphrodite. *P. officinale*, the great B., has four firm and reddish-coloured stamens facing the sepals, the corolla is absent, but there is a nectary round the style.

Burnet, Gilbert (1643-1715), Eng. historian and divine, was b. at Edinburgh, of one of the anct. and distinguished houses of Scotland. He was educated at Marischal College, Aberdeen, and after studying law for about a year gave that up in preference for divinity. In 1661 he took orders in the Episcopal Church, which had just been restored in Scotland on the Restoration. Shortly after his return from a continental tour he accepted the living of Saltoun in Haddingtonshire. In 1669 he was appointed prof. of divinity in the univ. of Glasgow. In 1673 he pub. his *Indication of the Church and State of Scotland*, and in 1676 *Memoirs of the Dukes of Hamilton*, an account of the civil wars in Scotland. In 1674 B., not being able to accept Landerdale's solution of the Church question, came to London, where he was, on the whole, favourably received and given the chaplaincy of the Rolls Chapel, and later he became lecturer at St. Clements. Between the years 1679 and 1681 appeared his *History of the Reformation of the Church of England*, for the first two vols. of which he received the thanks of Parliament. He showed himself independent of court influence, and offended Charles II. by the attitude which he adopted over the execution of Russell. On the accession of James II. he left the country and travelled in Europe, but finally settled in Holland, and had considerable influence over William. He returned to England with him, and was appointed bishop of Salisbury. His pastoral letter claiming England for William III. by right of conquest gave grave offence, and was publicly burnt by the hangman. His work in his diocese was vigorous, and he gave great attention to his pastoral duties. He suggested the scheme which was afterwards adopted in the provision known as Queen Anne's Bounty. In 1699 he was appointed tutor to the duke of Gloucester. His *Exposition of the Thirty-nine Articles of the Church of England* was pub. in 1699, an exposition which met with much condemnatory criticism at the hands of the clergy. His influence declined with the death of Queen Mary. He d. in March 1715, and was buried at St. James's, Clerkenwell. His great work, the *History of my own Time*, was directed to be pub. six years after his death. It was actually pub. in 1723 (vol. I.) and 1734 (vol. II.). This work was also bitterly attacked. Its most important parts are naturally the hist. of the Church in Scotland, the Catholic question

in England, and the negotiations previous to the Protestant revolution in 1688, all of which he was able to write on from his own actual experience. See T. E. S. Clarke and H. C. Foxcroft, *A Life of Bishop Burnet*, 1907.

Burnet, John (1784-1868), painter and author, b. at Fishierrow, near Edinburgh. His first-class engravings of the works of Wilkie first brought him renown. 'The Greenwich Pensioners' is the best and most popular of his own works, and was painted in 1837. He also wrote with authority upon art, his most important productions being *A Practical Treatise upon Painting* (1827), the editing of *The Discourses of Sir Joshua Reynolds* (1842), and *Rembrandt and his Works* (1849). He also wrote *Turner and his Works* (1852), to which Peter Cunningham (q.v.) contributed a memoir. He d. at Stoke Newington.

Burnet, John (1863-1928), Brit. Hellenist; regarded as the foremost Gk. scholar of his day in Great Britain. Born at Edinburgh and educated at Edinburgh and Oxford Univs. He was a master at Harrow (1888), and a fellow of Merton College, Oxford Univ. (1890). In 1892 he was appointed prof. of Gk. at St. Andrew's Univ., and remained there until his retirement as emeritus prof. in 1928. In the previous year he visited the U.S.A. as Sather prof. of Gk. at the Univ. of California. His publications include *Early Greek Philosophy* (1892), based on Zeller's *Philosophy of the Greeks*; *Greek Rudiments* (1897); *The Nichomachean Ethics of Aristotle* (1899); *Platonia Opera* (1899-1907); *Aristotle on Education* (1903); *Plato's Phædo* (1911); *Euthyphro, Apology and Crilo* (1914); *Greek Philosophy: Part I., Thales to Plato* (1914); *Higher Education and the War* (1917).

Burnet Saxifrage, see PIMPINELLA.

Burnet, Thomas (1635-1715), Eng. divine, was b. in Yorkshire, and educated at Clare College, Cambridge. He became a fellow of Christ's, and later senior proctor of the Univ. Later he became master of Charterhouse, and in this position he did his best to prevent the Catholic appointments of James II. He became clerk of the closet to William III., in succession to Tillotson, but by reason of the outcry raised by the publication of his *Archæologia Philosophica*, was forced to retire. He retired to Charterhouse, where he d. His two most famous publications were *Telluris theoria sacra* (1681), a work in which he put forward a fanciful idea of the structure of the earth, and which he afterwards trans. under the title of *The Theory of the Earth* (1684), and the book already referred to, *Archæologia Philosophica*, which he afterwards rendered into Eng. In this latter work he treated the Mosaic account of the creation as an allegory, with the result above mentioned.

Burnett, Frances Eliza Hodgson (Mrs. Stephen Townsend) (1849-1924), Anglo-Am. novelist, was b. at Chesham Hill, Manchester, daughter of Edwin Hodgson, house, furnisher and decorator, who settled in Tennessee at the conclusion of the Amer. Civil war. In 1873 she married

Dr. Swan B. and toured Europe. She obtained a divorce from Dr. B. in 1898, and married again in 1900. Her first successful production was *That Lass o' Lowrie's*, which appeared first in *Scribner's Magazine* in 1877. *Ilaworth's*, her next novel, was pub. in 1879. Her chief works following these two were *A Fair Barbarian* (1881); *Through one Administration* (1883); her most popular novel, *Little Lord Fauntleroy* (1886); and a host of short stories.

Burnett, George (1822-90), Scottish writer on heraldry, was called to the Bar in 1845. He early interested himself in Scottish genealogy, and wrote the greater part of an excellent *Treatise on Heraldry* (1892). His most valuable work is his *Erchequer Rolls, 1294-1507*, which he worked at from 1881 to 1890. Its twelve vols. contain much that is indispensable to the true appreciation of his country's hist. In 1866 he held the office of Lyon king of arms.

Burnett, James, see MONBODDO, LORD.

Burnett, Sir John James (1857-1938), Eng. architect, son of the Scottish architect, John B. Studied at Ecole des Beaux Arts, Paris. Entered his father's office in Glasgow and, later, founded his own firm in London. His most outstanding work is the King Edward VII. Memorial Galleries in the Brit. Museum, including the splendid N. front. Other buildings which he designed were, in Glasgow, the Royal Institute of Fine Arts and the Athenæum; in London, the Kodak building, Kingsway, and the General Accident, Fire, and Life Assurance Company's offices, Aldwych, and Adelaide House (London Bridge). His war memorials include the Cavalry Memorial, Hyde Park; the Jerusalem War Cemetery; and the Indian War Memorial in Port Tewfik, Egypt.

Burnett's Fluid, deodorant introduced by Sir Win. Burnett (1779-1881). It consists of a solution of zinc chloride which decomposes the strongly smelling ammonium sulphide, forming zinc sulphide and ammonium chloride, both of which substances are practically without odour. To burnettise wood or fabrics means to saturate the material with zinc chloride solution; this process prevents decay.

Burney, Sir Cecil (1858-1929), Brit. admiral, son of Capt. Charles B., superintendent of Greenwich School. Lieutenant of the *Carysfort* in Egyptian and Sudanese campaigns, 1882 and 1884. Rear-admiral, 1909; blockaded Montenegro and Albania, 1913. Vice-admiral, 1913. In Jutland fight on board the *Marlborough*. Second Sea Lord, 1917. Admiral, 1919. Admiral of the Fleet, Nov. 1920. Baronet, Jan. 1921.

Burney, Charles (1726-1814), Eng. doctor of music and writer, b. at Shrewsbury. Educated at the free school of that city and at Chester; for three years he was a pupil of Dr. Thomas Arne (q.v.) in London. He was an organist, a very minor musical composer, but a first-rate historian of music. Being threatened with tuberculosis, he accepted the position of organist at Lynn, Norfolk,

and here he conceived the general plan of his *History of Music*, which did not, however, begin to appear until 1776, or some six years after his travels (1770-72), to many of the prin. cities of the Continent to collect materials. Before the appearance of his *History* he pub. the results of his observations on contemporary music in three volumes—one in 1771 on the state of music in France and Italy, which was praised by Johnson, and the other on the state of music in Germany and the Low Countries (2 vols., 1773), the matter of both works being later incorporated in his *History*. The first volume of the *History* is a dissertation on the music of the ancients, and owes something to Padre Martini's similarly entitled *Storia della Musica* (Bologna, 1757-70). The great merits, however, of B.'s work have always been acknowledged, though the work did not escape some severe criticisms. Apart, however, from errors and omissions to be expected in a large scale and difficult work, the only really substantial faults are B.'s quite inadequate treatment of Handel and Bach in the fourth vol., a lack of appreciation of Bach which was shared by B.'s contemporaries. When, later, B. made the acquaintance of the '48' and other works his enthusiasm for Bach was as great as his previous indifference. Dr. Johnson was among his many admirers, whilst he owed to Edmund Burke his position as organist at Chelsea Hospital, 1783-1814. His life, written by his more famous daughter, Mme d'Arblay (see BURNLEY, FRANCES) appeared in 1832. See also P. Scholes, *The Great Doctor Burney*, 1948.

Burney, Charles (1757-1817), Eng. classical critic. His father was Charles B. (1726-1814). He was b. at Lynn in Norfolk, and was educated at Charterhouse and Caius College, Cambridge. He received at different times the honorary degrees of M.A. (Cambridge) and D.D. by the archbishop of Canterbury. He opened a school at Hammersmith in 1786 by which he became wealthy. He took orders in the latter part of his life, later becoming chaplain to the king. He d. at Deptford. His works include *Remarks on the Greek Verses of Milton* (1790); *Tentamen de Metris Æschyli* (1809). His valuable library was acquired by Parliament and deposited in the Brit. Museum as 'the Burney Library.'

Burney, Frances (Fanny) (1752-1840), novelist, was the daughter of Charles B., D. Mus. In 1761, a year after the family's removal to London, Mrs. B. d. Fanny was never 'placed in any seminary'; nevertheless, at the age of ten, she had already taught herself to read and write, and at once showed a delight in putting both the arts into constant practice. Her precocity as an authoress was probably due to the fact that, at her father's house, she was continually being introduced to the leading men of the day both in music and literature. Still, at the age of fifteen, she was induced to burn her MSS., as her step-mother considered the practice of scribbling unladylike. Her first and best novel,

Evelina, was actually pub. in 1778, but the story had been planned whilst Fanny was still in her teens. It was brought out in utmost secrecy, but the father was very proud of Fanny when she was admitted into the fellowship of the most distinguished literary people of the day. Johnson, who was her friend and admirer until death, declared that some passages in *Evelina* would do honour to Richardson. She received £20 in all for this novel. Burke, so the story goes, sat up all night to read it, and Reynolds would not touch his food until he had reached the end. For five years, 1786-91, Miss B. earned £200 a year as second mistress of the robes to Queen Charlotte.



FRANCES BURNLEY

She resigned this post when her health failed and accepted a pension of £100 a year, 'a munificence I had little expected or thought of' (*Diary*, June 4, 1791). She married a Fr. officer, M. d'Arblay (d. 1818) in 1793, and lived with him in France from 1802 to 1812. Their son was b. in 1794. Her other stories were *Cecilia* (1782), *Camilla* (1796), and *The Wanderer* (1814). Her famous *Diary and Letters*, which extended over seventy-two years, appeared posthumously between 1842 and 1846. The property known as Camilla Lacey, in Surrey, destroyed by fire in 1919, was built out of the subscriptions (£2000) for the novel *Camilla*. It was always her ambition to write, as Sheridan suggested, for the stage, and shortly after her marriage, she wrote a tragedy, *Edwy and Elvira*, in the hope of increasing her then slender income, but the play was a failure. Much earlier in life she wrote a comedy, *The Wiltshire*, but, by the advice of her father, it was not put upon the stage. Her only remaining work was a life of her father (1832), written

in an extraordinarily grandiloquent style. She *d.* in London on Jan. 6, 1840. She was by nature somewhat prudish and self-effacing quite unlike the *has bleus* of the day, yet authorities agree that her amazing egotism detracts from the charm of her autobiography. Some of her characteristics were family affection, loyalty to friends, a vein of snobishness and a curious insensitiveness. In the *Early Diary and Letters* and the remarkably fresh *Evelina* there is strong evidence of a great natural talent that promises a rich harvest. Yet her later novels, *Cecilia*, *Camilla*, *The Wanderer*, and even the *Memoirs* of her father, are all disappointments. She may have been intimidated by the praise and friendship of Johnson, Walpole, Burke, and Reynolds that resulted from so unstudied a novel as *Evelina* or spoiled beyond recovery by five deadening years at a dull court as second Mistress of the Robes. She is too anxiously part of her life at court and too impressed by the idea of royalty, to use her experiences there as she used those of her youth. She becomes less interested and less interesting an amateur writer who never grows up. During her lifetime she was overestimated, but her work is still regarded as an invaluable link in the early hist. of fiction. See A. Douson, *Fanny Burney*, 1903; M. Macfield, *The Story of Fanny Burney*, 1927; C. Lloyd, *Fanny Burney*, 1936; Averyl Edwards, *Fanny Burney* 1948, and the *Diary* in Everyman's Library.

Burnham Beeches, wooded region of 425 ac. near Slough in Buckinghamshire, England. It is the remains of an ant. forest, and consists of a number of beeches of tremendous girth. Gray, in a letter to Walpole dated Sept. 1737, remarked on their picturesque beauty (Gosse's *Life of Gray*, 1882; Wm. Mason's *Life of Gray*, 1774). In 1879 the City of London Corporation acquired them for public use. B. itself is a township of 4000 inhab.

Burnham, Sir Edward Levy-Lawson, first Baron (1833-1916), was *b.* in London, eldest child of Joseph Moses Levy, printer, who *d.* 1888. Educated at Univ. College School, Gower Street, and, on leaving there, became dramatic critic to the *Sunday Times*, owned by his father, who in 1855 bought the newly estab. *Daily Telegraph* and *Courier*, dropped the last half of its title, and organised it into a paying concern. Edward Levy, with Cobden and Bright, agitated for removal of the newspaper duty, and on its abolition in 1861 the *Daily Telegraph* became extremely successful. Edward, who in 1862 had married a daughter of Benjamin Webster the actor, assumed by royal licence in 1875 the additional surname of Lawson under the will of his uncle Lionel Lawson. The direction of the *Daily Telegraph* came into his hands in 1885. On the appearance of Irish Home Rule on the Liberal programme in 1885 he and his paper adhered to the Unionist cause. He continued the paper's policy of helping exploring expeditions, was made a baronet Oct. 13, 1892, and was raised to the peerage and retired from control of the

paper in favour of his son, the first Viscount B. (q.v.).

Burnham, Frederick Russell (1861-1944), Amer. scout, *b.* at Tivoli in the wilds of Minnesota; son of Rev. Edwin Russell. In 1893 he first visited S. Africa, and at once entered the service of the Brit. S. African Company, which was at war with the Matabele. In the second rebellion of the same tribe, he gained distinction by killing M'limo, the Kaffir high priest, who was the instigator of the revolt. In 1899 he served in the Boer war. In 1900 he was captured at Samu's Post, where Broadwood's convoy was surrounded, but made good his escape. At one time he destroyed the railroad between Pretoria and Johannesburg, and his last achievement in that region was the destruction of the line E. of Pretoria, his object being to prevent the Brit. prisoners from being taken away. He was made chief of the scouts of the Brit. army in the field, and received various decorations. He made surveys of the Volta R., W. Africa, 1902, and explored Congo basin, 1903-4. Made discoveries of Maya civilisation in Mexico, 1908.

Burnham, Sir Harry Lawson Webster Levy-Lawson, first Viscount and second Baron (1862-1933) (and Baronet), of Hall Barn, Beaconsfield, in the co. of Buckingham; *b.* in London; eldest son of Edward, first Baron, and grandson of Joseph Moses Levy, founder of the fortunes of the *Daily Telegraph* London newspaper. Educated at Eton and at Balliol College, Oxford. As a Liberal he represented W. St. Pancras in Parliament, 1885-92; he was called to the Bar at the Inner Temple, 1891; and he was on the London Co. Council, 1889-92 and 1897-1904. He was in Parliament again, as member for Mile End (Tower Hamlets), 1905-6; and again for same constituency, but as a Unionist, 1910-16. He was mayor of Stepney, 1908-9. In 1916 he succeeded to the barony, and was made a viscount, May 16, 1919. He presided at the International Labour third, fourth, and ninth Conferences at Geneva, 1921, 1922, and 1926. He was appointed a member of the Indian Statutory Commission, 1927. The 'Burnham award' as to school-teachers' salaries is the work of a standing committee of which he was chairman. The *Daily Telegraph*, of which he had the management since 1903, and the proprietorship since 1916, he sold in 1927.

Burnham-on-Sea, tn. in Somerset, England, on an estuary of the Parret with extensive sands, a lighthouse, a number of hotels, and an excellent golf course. Pop. 5600.

Burnie, post tn. and port of entry and clearance of Wellington co., Tasmania, on Emu Bay. It is 67 m. W.N.W. of Launceston, and the terminus of the railway to Mt. Bischof. Pop. 2500.

Burning, see COMBUSTION.

Burning Bush, or *Eumonymus atropurpureus*, is a species of Celastraceae found in N. lands. The seeds have a brightly coloured arillode, which attracts birds, and thus plays its part in their dispersal.

Burning Glasses and Mirrors. A lens

may be used to bring the heat-rays of the sun to a focus in the same manner, though not quite at the same point, as the rays of light are focused. The heat thus brought to bear on a small area is sometimes used for fusing metals, etc. The effect may be produced by reflection through the use of concave mirrors or a concave system of plane mirrors. In the 'solar engine' the heat reflected from several thousand plane mirrors arranged on a huge concave frame is focused upon a small boiler and utilised in driving an engine for pumping operations, etc. Special machinery is provided to keep the apparatus facing the sun. Archimedes is said to have burnt the Rom. fleet of Marcellus before Syracuse by concentrating the heat reflected from several large burning mirrors upon it. See LENS, REFLECTION.

Burnley, mkt. tn., municipal co. and parl. bor. of Lancashire. It stands at the confluence of the Brun and Calder. Charles Towneley, whose collection of antique marbles and bronzes reposes in the Brit. Museum, was b. here. Besides the staple trade, cotton spinning and weaving, there are several large machine works, iron foundries, paper mills, and a hardware factory. Towneley Hall is now a museum and art gallery. The Paulinus Cross is said to have been erected to commemorate the preaching of St. Paulinus in this dist. about A.D. 600. Pop. 98,258. The damage suffered by B. through air raids was negligible.

Burnouf, Eugène (1801-52), son of Jean Louis B., famous Fr. orientalist, was b. in Paris on April 8. He collaborated with Christian Lassen in producing an *Essai sur le Pâli* in 1826. He undertook the great task of deciphering the Zend MSS., and through his instrumentality a knowledge of this tongue was first brought within the scientific world of Europe. He was a member of the Académie des Inscriptions and prof. of Sanskrit for twenty years. He also wrote a *Commentaire sur le Yacna. l'un des livres liturgiques des Parses* (1833-1835), and pub. (1829-43), in folio parts, a lithographed copy of the *Vendidad Sade* made from the Zend MS. of Zoroaster in the Bibliothèque Nationale.

Burnous, loose full cloak worn by Arabs, generally white, and with a hood resembling that of a Capuchin monk.

Burns and Scalds, destruction of tissue by dry heat in the former case, by moist heat in the latter; the general symptoms and treatment are the same in both cases. B. are usually classified according to the depth to which the tissues are affected. Dupuytren suggested the following classes: (1) Where the skin is reddened. A slight swelling is apparent which usually disappears quickly; there is considerable pain at first, but the condition is rapidly cured. (2) Where the outer skin is destroyed, more or less extensive blisters containing serum raising it from the true skin. A fair amount of pain is felt; the outer skin is cast off after the blister has been pierced, and a new skin forms without any scar remaining. (3) Where the true skin is partly destroyed. The pain is considerable, black or brownish sloughs

occur, and there is danger of septic poisoning. When the wound has healed, a slight scar or puckering of the skin is observable. (4) Where the true skin is wholly destroyed. The condition is serious, but is not accompanied by much pain, as the nerve-endings have been destroyed. After healing, a deep scar can be noticed. (5) Where the soft parts, muscles, etc., have been destroyed. (6) Where the bones have been charred, a very serious condition, which can usually only be met by amputation. The dangers from B. include shock, septic poisoning, inflammation of internal organs, and general exhaustion. The danger from shock depends upon the extent of the burnt area; it is estimated that cases in which over one-third of the total body-surface is seriously affected end fatally. The whole nervous system has functioned very rapidly and with great intensity, and cannot undergo repair sufficiently to keep the organism alive. The result is coma, leading to death. The danger of sepsis arises from the fact that the tissues beneath the skin have been laid open to the action of micro-organisms in the atmosphere. The extent to which the tissues have been laid bare determines the extent of the danger, the same precautions having been taken. Complications with respect to underlying or other organs may arise through the loss of the skin's functions, the disturbance of the blood supply, and the possible introduction of germs peculiarly harmful to those organs. Exhaustion of the system is a natural result of the strain occasioned by the healing process and interference with the nutritive functions, as in cases of scalds of the throat and stomach. The symptom demanding most immediate treatment is shock. Vitality should be preserved by wrapping the patient in hot blankets, placing hot-water bottles at the extremities, and administering stimulants. The condition of shock lasts from thirty-six to forty-eight hours. Local treatment of B. aims at preventing infection, relieving pain, and promoting healing with a minimum of deformity or scarring. If the burn be slight, the blisters may be pierced, their contents drained off, the outer skin cut off and the surface treated with a weak solution of picric acid. In dealing with severe B., care must be taken not to tear affected tissues by rough handling of clothing. The clothes should be carefully cut off, the whole surface should be treated with an antiseptic, and then the more permanent dressing adjusted. This usually consists of gauze soaked in picric acid solution and covered by antiseptic wool, the whole being lightly bandaged, as it is desirable to exclude all air, but without undue pressure upon the injured part. Two affected surfaces must not be placed in contact, as the result might be a union of the two surfaces. In cases where the destruction of the true skin has been extensive, skin-grafting has been adopted with satisfactory results. An aqueous solution of tannic acid (10 per cent) has recently been introduced for the treatment of B. with the object of forming a

protective surface; moreover, by promoting coagulation it helps to prevent the absorption of toxic materials produced by burnt tissues. It may, however, conceal the onset of sepsis; it is also liable to cause contraction and loss of function. Gentian violet (1 per cent aqueous solution) has also been used with success. Irrigation of the affected part with warm saline in the Bunyan-Stannard envelope is another method giving good results. The toxins cause damage to the cortex of the suprarenal bodies, which can be counteracted by injections of cortical extract, or preferably of synthetic corticosterone; the liver lobules are also affected adversely, calling for administration of glucose. Some surgeons give blood transfusions to counteract toxæmia. Sulphonamides and penicillin are useful in cases of severe infection.

Burns, Jabez (1805-76), nonconformist divine, educated at Chester and Oldham Grammar School. While a boy he joined Methodist New Connexion; 1826 came to London; compiled *Christian's Sketch-Book*, 1828 (second series issued 1835); *Spiritual Cabinet* (1829). B. did much mission work on behalf of Scottish Baptists, becoming pastor of a Perth congregation, 1830-35, 1835, pastor to Baptist congregation at Marylebone. He was said to have been the first clergyman to preach teetotalism from the pulpit. He delivered thirty-five ann. temperance sermons, beginning Dec. 1839. Member of the Evangelical Alliance, formed 1845; after 1847 travelled in America, Egypt, and Palestine. Among his works are *Notes of a Tour in U.S.A. and Canada in 1847* (1848); *Helpbook for Travellers to the East* (1870); *The Golden Pot of Manna, or Christian's Portion* (1848); *Preacher's Magazine and Pastor's Monthly Journal* (1839-44); *Sermons* (1842).

Burns, John (1858-1943), Eng. politician, was b. at Vauxhall, London, second son of Alexander B., an engineer of Scottish extraction. He received education to the age of ten at a national school; then he was sent to work, but continued study at night schools. He worked at first in Price's candle works; he was for a short time a page, and finally was apprenticed to an engineer, and whilst in his apprenticeship he adopted socialism. He worked at his trade on land and on board ship, and went for a year to W. Africa. He had in the meantime become known as a labour agitator. In 1886 he cleared himself of the charge of instigating the mob to violence on the occasion when the clubs of the W. End had their windows broken. In the following year, however, he suffered six weeks' imprisonment for his share in the Trafalgar Square riots. In 1885 he had been unsuccessful as the candidate of the Social Democratic Federation at W. Nottingham. He was a member of the Amalgamated Society of Engineers. He sat on London's first co. council as a Progressive member for Battersea, and in 1892, as the candidate put forward by a local 'Labour League,' he became member of Parliament for the same constituency. He was active in securing good conditions

of employment both in the L.C.C. service itself and in the undertakings of its contractors. The 'fair wages clause,' which became general in local gov., was his drafting. In 1889 he had, together with Mr. Ben Tillett, been the chief organiser of the London dock strike. He retained his seat for Battersea in 1895; and again in 1900. He continued to sit for Battersea until 1918. He was made president of the Local Gov. Board in Sir Henry Campbell-Bannerman's administration, 1906, being the first working man to attain to Cabinet rank, and became a Privy Councillor. By that time he had very largely lost popularity with the Socialist rank and file—partly on account of his having taken office with the Liberals, partly on account of the Puritan bluntness with which he rebuked the failings of his own class. He took an active share in social legislation during his period of office, introducing the House and Town Planning Bill in 1909. On the declaration of war, Aug. 1914, he was one of the three ministers who immediately resigned. He remained in that very long Parliament, till its close, a silent member. He would never join the rising Labour party, and retired into private life towards the end of the First World War, rather than stand for the general election of Dec. 1918. Though physically and mentally full of vigour he accepted retirement on a competence provided by Andrew Carnegie and lived to all appearance content among the books which filled his home. He passed completely out of public life, but by no means out of recollection. He was striking in appearance, with deep-set gleaming eyes under heavy brows, dark hair and trim beard, which turned with age to snowy white; an alert vigorous manner and a constitution inured to the hardest weather. A vigorous rather than a polished orator, he had command of apt citation and of epigram, if at times bordering on magniloquence.

Burns, Sir John, see INVERCLYDE, BARON.

Burns, Robert (1759-96), greatest lyric poet Scotland has ever produced, was b. Jan. 25, near Ayr. He was the son of a gardener, who later in life turned farmer, and in spite of a hard struggle with poverty, succeeded in equipping his children with a good education. Although Robert had perforce to assist his father in his humble vocation, he still found plenty of time to assimilate so much instruction and reading that by the age of sixteen years he had acquired the elements of what was then regarded as an 'elegant' education. This included the elements of astronomy, belles-lettres, and, of course, poetry, at that time in a transition state between the heavy fancies of the Popean school and the tinkling prettiness of the Della Crusceans. Neither of these schools was likely to assist a young singer whose native talent leant strongly towards the natural, and although we discover marked traces of the influence of both in his later work we must regard B. as among the first to free Eng. verse from the

shackles of formalism which had bound it so long. At the age of sixteen B. was already a minor celebrity in his dist., and his convivial and generous disposition speedily brought him into contact with the bolder spirits of the neighbourhood, who regarded him as a species of local laureate. In 1781 he entered with his brother upon the tenancy of a small farm, a venture which proved most unfortunate, so much so that embittered by his lack of success he resolved to leave his native land and take ship to Jamaica. With the object of purchasing his passage thence he pub. his poems at Kilmarnock in 1786. The result was a furore of appreciation which dazzled and somewhat unbalanced the young farmer. He was encouraged to proceed to Edinburgh and to publish a second ed. there. This he did, and met with a splendid reception from the *élite* of literary circles in the capital. At many of the houses of the great he was wont to recite his poems to a rapt audience, and his genius was fully recognised. But when a man is born with an utterance like swift fire he is not as a rule particularly zealous regarding the proprieties, and B.'s habits speedily marked him out as 'impossible' in the circles which he had once illuminated. A vigorous habit of speech and criticism of persons whom their equals had agreed to treat with respect by reason of qualities too subtle or too difficult of discernment by the Ayrshire farmer led him into disrepute, and the all too frequent occasions on which he transgressed against decency were too much even for an age of hard drinking, and social taboo was passed upon him with every show of reason. On the one hand B. was ignorant of the true reading of the term *noblesse oblige*. On the other his mighty soul soared high above the society folk with whom he was brought into contact, and whom, for the most part, he regarded with good-humoured contempt. Meanwhile the profits of his vol. of poems pub. in the cap. had brought in a very considerable sum, with which he was enabled to take the farm of Kilsland near Dumfries, where he settled in 1788, with his wife Jean Armour, the 'Bonnie Jean' of one of his most beautiful lyrics. Private interest had also brought him the position of an exciseman, or 'gauger' as they were then known in Scotland; but for a second time he found farming a failure, and retired to Dumfries, where he subsisted on his exciseman's salary, which never rose above £70 per annum. At this period of his life he enthusiastically embraced the principles of the Fr. Revolution, and many of his poems and songs exhibit his hatred of the 'lordlings' who at that period held the peasantry of Scotland in a condition approaching helotage. At the same time it must be recollected that he had not disdained patronage on sev. occasions, but had certainly accepted it in a spirit of generous faith. His dissipated habits rendered him obnoxious to the 'respectable,' and as these grew upon him he began to consort with people who, however interesting on occasion or during the hilarity of a drinking bout, were no

companions for a man of his exalted and generous spirit. Deeper he sank into the pit which his own natural, joyous, and trusting disposition had dug for him. Remorse gnawed at his heart and he became gloomy and sullen, with only occasional flashes of his old magnificence; and at the last his sun set in gloom and sadness, for with health and fortune completely broken, he sank to rest at Dumfries on July 21, 1796. Like Byron, B. was one of those poets who are as great as their songs. It was not his to create a social cult which might cluster around his personality, having for its basis the imitation of the mannerisms and idiosyncrasies



ROBERT BURNS

of its idol. His cult was greater. It was and is the cult of the expression of nationality, of all that is virile and spirited in that elder Scotland which sank in a blaze of glory to the sound of his songs. To his countrymen he has left the deathless heritage of a song-craft unequalled in the lyric hist. of mankind. His lyre has run the gamut of the emotions, from the whisper of love to the fire-filled chant of war and liberty. In the utterance of no poet have passion and simplicity been so truly welded. The simple, almost rustic, lines are fulfilled and suffused with a lofty genius which compels the tears of both simple and learned. So intimate is the combination of artlessness and genius in the songs of B. that in no poet is it so difficult to trace the true quality of that genius. In none is it so elusive. It is enwoven in the very fibre of the verse. The felicity of B.'s language is due not so much to his perfect mastery of his medium as to his brilliant poetic

penetration and his swift habit of intuition. But withal he exhibits no impatience with poetic rule, and nicely if naturally observes the proprieties of rhythm, diction, and metre. He divides the lyric crown with Shelley, with whom he is equal in ardour, intensity, and originality. If inferior in imaginative power and mental scope. B.'s system of composition consisted in selecting Scottish folk-songs, which he made the basis of new and more poetical versions. But besides this he composed scores of original verses. His purely lyrical work is too well known to require mention here. But his narrative and satirical work is by no means so widely read. Perhaps his greatest work, apart from his songs, is his *Tam o' Shanter*, which is almost epic in parts, exhibiting a felicity of phrase and an epigrammatic ability which are far above the subject handled. His *Three Dogs* bristles with keen satire against the social and religio-political follies of the time. His *Cottar's Saturday Night* is truly national in spirit, and strikes the note of all that is exalted and noble in the Scottish character. It only remains to notice B. as a letter-writer. In an age when the epistolary art was at the height of its prolixity and formality, and when explicitness, clarity, and real beauty of phrase were sacrificed to pomposity, B. partook copiously of the faults of his time; indeed they appear in him almost exaggerated. But he did not, like so many of his contemporaries, sacrifice feeling to bombast, and his tenderness was too much the result of genuine human affection to degenerate into sentimentalism. These qualities of humanity and tenderness appear throughout his works to dominate even the waywardness which was perhaps his prin. characteristic. He was a great poet, a great lover of humanity, and a great natural man; and 'his faults were the faults of his qualities.'

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Burnside, suburb of Adelaide, S. Australia; pop. about 1500.

Burnside, Ambrose Everett (1824-81), Amer. soldier, a native of Liberty, Indiana. He became a member of the Military Academy but resigned his commission in 1853 and adopted the manuf. of firearms. Three years later he invented

a breech-loading rifle. He took a prominent part in the first battle of Bull Run, and was appointed brigadier-general of volunteers in 1861. He sailed in the following year for the N. Carolina coast, and in the ensuing campaign won the victories of Roanoke, Newbern, and Fort Macon. Shortly afterwards he was made major-general, U.S.V. President Lincoln appointed him to succeed Maclellan to the army of the Potomac. He was thoroughly defeated at Fredericksburg in 1862, and aroused much criticism by his suppression of press opinion. The failure of the 'Burnside mine' at Petersburg (q.v.) caused his resignation in 1864. In 1866 he became governor of Rhode Is. He was a Republican member of the Congress till his death. He d. at Bristol, Rhode Is.

Burnside, Helen Marion (1844-1923), Eng. artist and poet, exhibited at the Royal Academy in 1863. From 1880 to 1889 she was designer at the Royal School of Art Needlework. For the next five years she was editor to Messrs. Raphael Tuck. She also wrote many songs and magazine stories, but she is known more especially as the writer of children's books.

Burnt-Ear, or *Uredo carbo*, a species of fungus of the order Uredineæ which is particularly destructive to corn. The seed-coat of the grain attacked is covered with a black dust, while the interior seems to be untouched, but is found to be abortive.

Burntisland, seaport on the firth of Forth, Scotland. Coal is shipped in considerable quantities. It has a ship-building industry and railway workshops. Rosend Castle is here, built 1119. The influence of the close intercourse which once existed between B. and Holland is expressed in the par. church, which resembles the North Church, Amsterdam. It was here that James I. pressed his proposals for a new translation of the Scriptures into Eng. Pop. par. 6500; burgh 3800.

Burnt Sienna, reddish-brown pigment. It takes its name from Siena in Italy, where an earth is found containing oxides of iron and manganese. The substance is brownish-yellow in colour, which deepens to a reddish-brown when the earth is burnt.

Burnt Stones, old cornelians possessing a glowing red colour when held to the light. They are found in ruins and have a dull appearance externally. They appear to have been acted upon by fire.

Burr, Aaron (1756-1836), Amer. legislator and native of New Jersey. At Princetown College, where his father and grandfather had occupied the presidency, he graduated. He joined the patriot army in 1775, and two years later was rewarded for his valour and abilities by promotion to lieutenant-colonel. He retired in 1779, and was called to the Bar, where he quickly assumed a prominent position. From 1788 to 1790 he was attorney-general; senator (1791-97); and vice-president (1801-5). He fought a duel with Alexander Hamilton, who was responsible for his defeat in obtaining the governorship of New York, and killed him.

Flight to S. Carolina was necessary till the excitement lessened, when he returned. An attempt to raise revolution in Texas in order to establish a republic there resulted in his arrest. He was acquitted, but was socially ostracised. A return to his practice failed hopelessly, and he *d.* miserably on Staten Is. During his last years he was maintained by a friend.

Burr, William Hubert (1851-1934), Amer. engineer, was *b.* at Watertown, Connecticut. He became prof. of engineering at Harvard Univ. in 1892, and at Columbia Univ. in 1893. In 1899 he was appointed a member of the Isthmian Canal Commission to report upon a route for the Panama Canal; in 1904 he was appointed a member of the commission to construct the canal; and in 1905 he was appointed a member of the international board of consulting engineers to determine the plan of the canal. In 1919 he was appointed a member of the board of consulting engineers for constructing a vehicular tunnel under the Hudson R. at New York city. Publications: *The Stresses in Bridge and Roof Trusses* (1881); *Elasticity and Resistance of the Materials of Engineering* (1883); *Ancient and Modern Engineering and the Isthmian Canal* (1902); *Suspension Bridges, Arch Ities, and Cantilevers* (1913).

Burra, see KOORINGA.

Burra-Burra, celebrated copper mine in S. Australia. It is situated N. by E. of Adelaide, and is 101 m. distant. Ore to the value of £4,000,000 has been mined, though operations are no longer so remunerative.

Burrard Inlet, narrow inlet of Brit. Columbia, situated at the S.W. extremity. It forms a magnificent harbour, and is the inlet on which stands Vancouver, the W. terminus of the Canadian Pacific Railway.

Bur-reed is the name applied in England to the species of *Sparganium*, a genus of plants of the order Typhaceæ (Typhids or Bulrushes), common to Europe and Australia. Four species occur in Britain: the Branched (*S. ramosum*), Unbranched Upright (*S. simplex*), the Floating (*S. natans*), and Small B. (*S. minimum*). They occur in ditches and shallow ponds of Britain.

Burriana, Sp. tn. and seaport situated on the E. coast, in the prov. of Castellón de la Plana. Its pop. is 16,000. Oranges are the chief export, while there is some trade in oil, grain, and wine.

Burrillville, city of Rhode Is., U.S.A. Pop. 8000.

Burritt, Elihu (1810-79), Amer. philanthropist, commonly called 'the learned blacksmith.' He was a native of New Britain, Connecticut. His grandfather and father had served in the revolutionary army. His education was self-obtained from whatever books were available at home. He became apprenticed to a smith at the age of sixteen, and adopted smith work as his trade. He was able to indulge a passion for literature in any form in his spare moments at the forge, while for a short time he attended a school kept by his brother Elijah. In this desultory

fashion he conquered Lat., Gk., Fr., Sp., and Ger., and by the time he was thirty years of age could read nearly fifty languages. He gradually acquired fame with his increasing store of knowledge, and soon embarked upon a lecture tour to various places in U.S.A. and Europe on behalf of peace. He organised the Friends of Peace at Brussels, Paris, Frankfurt, London, Manchester, and Edinburgh, and pub. innumerable pamphlets. He founded the *Christian Citizen* at Worcester to advance his views. He returned to America and *d.* at New Britain.

Burroughs, John (1837-1921), Amer. essayist and authority on natural hist. He was *b.* at Roxbury, Delaware co., New York. Among his early callings were teaching, journalism, and farming. In the treasury dept. of Washington he served as a clerk for nine years. His early productions included *Wake-Robin* (1871), *Birds and Poets* (1877), *Locusts and Wild Honey* (1894), and *Ways of Nature* (1905), in prose; while in verse he pub. a vol. called *Bird and Bough* (1905). Other works: *Whitman: a Study* (1902); *The Summit of the Years* (1913); *The Breath of Life* (1915); *Under the Apple Trees* (1916); *Field and Study* (1919); *Birds and Bees* (posthumous) (1926). See Clara Barrus, *Life and Letters of John Burroughs*, 1925; C. H. Osborne, *The Religion of John Burroughs*, 1930.

Burrowe, Stephen, see BOROUGH, STEPHEN.

Burrowing Owl, or *Speotyto cunicularia*, is a native of America. It is about 9 in. long, has no ear-tufts, and its legs are long and poorly feathered. It inhabits burrows and holes of caves, lizards, foxes, squirrels, and other animals, and there it makes its nest.

Burrows, Montagu (1819-1905), Eng. historian, was *b.* at Hadley, Middlesex. He entered the navy, and rose to the rank of commander, 1852. He then went up to Oxford, taking a double first, and from 1862 till 1900 was Chichele prof. of modern hist. He became a fellow of All Souls in 1870, and pub. *Worthies of All Souls* in 1874. His other works include *Memoir of Admiral Sir H. Chads, G.C.B.* (1869); *Parliament and the Church of England* (1875); *Oxford during the Commonwealth* (1881); *Wyclif's Place in History* (1882); *Life of Admiral Hawke* (1883); *History of the Cinque Ports* (1888); *Commentaries on the History of England* (1893); *History of the Foreign Policy of Great Britain* (1895).

Burrows, Ronald Montagu (1867-1920), Eng. archaeologist, was *b.* at Rugby, where his father, the Rev. Leonard Francis B., was a master; but he was educated at the Charterhouse and at Christ Church, Oxford. While assistant to Prof. Gilbert Murray in the Gk. dept. of Glasgow Univ. 1891-97, he excavated at Pylos at the S.W. extremity of the mainland of Greece, and in the adjoining is. of Spakteria, 1895-96; and the results, described in *Hellenic Studies*, cleared the credit of Thucydides as a historian. In 1905 and 1907, while he was prof. of Gk. at Univ. College, Cardiff (1898-1908), he excavated at Rhihtóna in Boeotia, with the object of

ascertaining the site of Mykalessos—in the latter year in conjunction with P. N. Ure. In 1907 he pub. *The Discoveries in Crete and their Bearing on Ancient Civilisation*. In 1908 he became prof. of Gk. at Manchester Univ. He was appointed principal of King's College, London, in 1913; and in the war years was a friend of Venizelos. He was well versed in the affairs of the Slavonic world.

Burrstone, see BURRSTONE.

Burrus, Sextus Afranius, native of Gaul who became a Rom. soldier of distinction. He was the trusted agent first of Livia and then of Tiberius and Claudius. He had a share in the education of Nero, and aided Agrippina in bringing him to the throne in preference to Britannicus. When the partisans of Britannicus were punished B. succeeded to the important command of the prætorian guard. He was put to death by Nero in A.D. 63.

Burry Port, urb. dist., Carmarthenshire, Wales, 4 m. W. of Llanelly. Pop. 6000.

Bursa, synovial sac or closed space containing liquid between two moving surfaces of the body. Its function is to lessen the effects of friction, and bursæ may either be permanently situated for that end, or developed in a part where friction has caused a certain amount of irritation of the tissues. Bursæ may be classified as (1) bursæ between the covering skin and bony projections, as at the point of the elbow and at the knee-cap; (2) bursæ between tendons and the surfaces they cross; (3) bursæ between tendons and the walls of osteofascial tunnels.

Bursar, term used at Oxford and Cambridge Colleges for the official who keeps the college accounts. It is also used in the same sense in public schools, and in 1932 an association of these officials was founded. His office is called the bursary. This latter word is used in Scotland to denote a grant of money to be made to a student, the equivalent of a scholarship or exhibition in England.

Bursaria is a genus of ciliate Protozoa of large size, in which the body appears to be convex above and concave below. Lamarck described five species of these fresh-water creatures, of which *B. truncatella* was one.

Burscheid, tn. of the Rhineland, Germany. It is situated on the R. Wupper, and manufs. woollen goods and plush. Its pop. is 7000.

Burschenschaft, name of an association of students of the univs. of Germany, founded in Jena in 1830. It owed its inspiration to the national sentiment aroused in Germany by the war of Liberation and its object was to encourage and engender patriotism and a Christian bearing. Its chief patron was the grand-duke of Saxo-Weimar. It took a prominent part in the revolutions of 1830 despite the provisions of the Carlsbad decrees which, however, in 1833 secured its suppression. It was resuscitated in 1848 but gradually lost its political character. The B. is now extinct. See G. Heer, *Geschichte der Burschenschaft*, 1927-29.

Bursaceæ is a natural order of di-

cotyledonous plants which are found in the tropics, and yield balsam, resin, and gum. The flowers are small and regular, with the disk usually annular, in parts of four or five, with a syncarpous gynoecium consisting of three to five carpels, with two ovules in each loculus. The fruit is a drupe or a capsule, and the bast contains resin passages. Two well-known species are *Boswellia serrata*, which yields olibanum, and *Commiphora abyssinica*, which yields myrrh.

Bursi, see BARSI.

Bursitis, inflammation of a bursa. It may be acute, when pus forms after an injury or strain, as in the knee-cap. The joint should be cleansed and absolutely rested for some time. It may also be chronic, when a large amount of watery fluid collects at a joint, with possible formation of concretions within the bursa or thickening of its walls. This is usually due to pressure constantly applied to a joint as in 'housemaid's knee.' The joint should be rested and the bursa drained. The period of resting should be prolonged as much as possible, as there is always a likelihood of the condition being estab. again if the joint is subjected to the same usage as formerly. Surgical measures for removal of the thickening may be indicated.

Burslem, formerly bor. and nrkt. tn. of Stafford, England, is now included in the co. bor. of Stoke-on-Trent, of which it forms five wards. In the seventeenth century it was the prin. place in England for the manuf. of earthenware, and is still called the 'mother of the potteries.' Josiah Wedgwood was b. here in 1730, and the Wedgwood Memorial Hall was opened by the marquess of Ripon in 1869. The B. and Tunstall War Memorial Hospital commemorates the victims of the First World War.

Bürstadt, tn. in Hesse, Germany. Pop. 8000.

Burton, Sir Frederick William (1816-1900). Irish painter, b. in co. Clare. Educated at Dublin under the direction of Mr. Brocas. Elected associate of Royal Hibernian Academy when only twenty-one years of age. In 1842 he began to exhibit at the Royal Academy. He travelled much on the continent of Europe, where he gained an intimate knowledge of the works of the old masters. In 1874 he was appointed director of the Brit. National Gallery. Elected associate of the Royal Society of Painters in Water Colours in 1855.

Burton, John Hill (1809-81), Scottish historian, b. at Aberdeen. He graduated at Aberdeen Univ., and was articled to a writer, but his articles were cancelled, and he went to Edinburgh to qualify for the Bar. His practice was not large, and he had to devote himself to literature. During this time he wrote for the *Edinburgh Almanac*, *Westminster Review*, and contributed to the *Cyclopædia of Universal Biography* and Waterton's *Cyclopædia of Commerce*. In 1846 he achieved great distinction with his biography of David Hume. In 1847 B. produced his interesting biographies of Simon Lord Lovat and

Duncan Forbes. In 1854 he was appointed secretary to the prison board of Scotland, and became a prison commissioner. He held office as historiographer royal for Scotland. His chief works are *Manual of Political and Social Economy* (1849); *Communism* (1854); *The Book Hunter* (1862); *The Scot Abroad* (1864); *The Cairngorm Mountains* (1864); and, above all, *The History of Scotland from Agricola's Invasion to 1688* (1867-70 and 1873).

Burton, Sir Richard Francis (1821-90), Brit. explorer, b. at Barham House, Hertfordshire. He spent most of his childhood in Italy and France. He was educated at Trinity College, Oxford, and entered the Indian Army in 1842. During his stay in



SIR RICHARD BURTON

India he studied assiduously the various oriental languages, and rapidly reached proficiency. He was appointed assistant in the Sind survey, which enabled him to mix with the people. He frequently passed as a native in the bazaars, and thus gained an excellent knowledge of E. life and customs. On his return home he pub. an important work on Sind, together with three other books. In 1853 he made a pilgrimage to Mecca, which was to make him famous. He went disguised as an Indian Pathan. The book he wrote, called *The Pilgrimage to El-Medinah and Mecca* (1855-56), contains a most interesting account of his journey and exploits. His next journey was into the Somali country in E. Africa. He went to Harar, the Somali cap., which had hitherto never been entered by a white man, and stayed there four days. Afterwards he vanished into the desert, and nothing was heard of him for four months. He next served on Gen. Beacons's staff in the Crimea. In 1856 he went with Speke to Africa, and explored the lake regions of equatorial Africa. They discovered Lake Tanganyika in 1858, and Speke, during B.'s

illness, discovered Victoria Nyanza. In 1861 B. was made consul of Fernando Po, whence he was shifted successively to Santos in Brazil, Damascus, and Trieste, which post he held till his death. B. married Isabel Arundell in 1861, and she accompanied him henceforth on all his journeys. He received the gold medal of both Fr. and Eng. geographical societies. He was master of thirty-five languages and dialects. He was knighted in 1888. He wrote numerous books, chief of which are *First Footstep in East Africa: Harar*, (1856); *Abeokuta and the Cameroon Mountains* (1863); *Wanderings in West Africa* (1863); *Explorations of the Highlands of Brazil* (1869); *Gold Mines of Midian and the Ruined Midianite Cities* (1878). His chief work is his translation with copious notes of the *Arabian Nights* (1885-88). He also trans. *The Lusians of Camoens* (1881). His wife built an Arab tent of stone and marble to his memory at Mortlake. See lives by Lady Burton, 1894; T. Wright, 1906; W. P. Dodge, 1907.

Burton, Robert (1577-1640), Eng. humanist and writer, famous for *The Anatomy of Melancholy*. He was b. at Lindley Hall in Leicestershire on Feb. 8, the fourth of a family of nine. He received his education at the free school at Sutton Coldfield and at Nuneaton Grammar School, and in 1593 entered Brasenose College. In 1599 he became an elected student at Christ Church, where he spent the remainder of his life. In 1616 he became vicar of St. Thomas's and in 1630 rector of Seagrave in Leicestershire (through the patronage of George, Lord Berkeley). He held both livings until his death. Some years previous to his death he predicted its occurrence in his sixty-second year by a calculation of his nativity. In appearance he was a thick-set, plumpish man, with dark brown beard of formal cut, a satiric glint in his large eyes, and a monumental forehead revealing intelligence and memory. In 1606 he wrote a Lat. comedy called *Philosophaster*, and rewrote it in 1615. It was acted by students in 1617; it was then for some considerable time lost, but was rediscovered in 1862. His book, *The Anatomy of Melancholy*, appeared in 1621, and the author signed himself Democritus Junior. In his very extensive preface he refers to the influence of Democritus and Hippocrates upon his proposed work, and also gives his reasons for writing it. In the book itself he first defines melancholy, and divides it up into its various kinds. He proceeds then to examine the causes of melancholy, and then goes on to give the methods by which it may be cured. The concluding section of the work deals with religious melancholy. B. had no intention of compiling a doleful work. He was a good-humoured pessimist. He is indeed somewhat of a paradox and not quite consistent. 'It is the most sententious book ever written, yet it reads trippingly as a novel. It is packed with common sense and uncommon nonsense. He mixes facetious with theology, is most frivolous when most earnest, and, when colloquial, is most

profound. He was first and last a bookman and his treatise is the legitimate offspring of a bookish mind, and although it is largely a distillation of authors it is an original work' (Hollbrook Jackson). Sir Wm. Osler described the *Anatomy* as 'the greatest medical treatise written by a layman,' but apart from the main theme there are sections which, although organically related to it, are complete essays in themselves. To sum up, 'Burton is revealed as a sound political economist, a little-Englander, a protectionist, an opponent of monopolies, an enemy of war, an advocate of better highways, the extension of inland waterways, the reclamation of marshlands, the building of garden villages, and the granting of old age pensions' (Hollbrook Jackson). The curious learning found in *Tristram Shandy* had been pilfered from this book, and it was Ferrier's ed. of *Tristram Shandy*, in which he pointed out Sterne's unacknowledged obligation to Burton, which drew attention once more to this almost forgotten book. There were revised eds. of the *Anatomy* in 1624, 1628, 1632, 1638, and 1651. It was reprinted in 1660 and 1676, and a 2-vol. ed. was pub. in 1800. Further eds. are those of A. R. Shilleto (1893, 1925), F. Dell and P. Jordan-Smith (1927, 1930), and H. Jackson (Everyman's Library, 1932). An Eng. trans. of *Philosophaster*, including B.'s minor writings in prose and verse, was pub. by P. Jordan-Smith in 1931.

Burton-in-Kendal, tn. and par. in the dist. of Kendal, adjoining Furness, and belonging to Lancashire. R. is 10 m. S. of the tn. of Kendal, and is situated on a limestone ridge with large pockets of iron ore in its vicinity. Pop. 500.

Burton upon Trent, co. bor. in E. Staffordshire, England, situated on the R. Trent and Trent-Mersey canal, W.S.W. of Derby. Area 4222 ac. It is a tn. rich in historical associations and was formerly the seat of a Saxon abbey. In 1801 the pop. was not much over 6000. Its rapid growth dates from the opening of the Midland railway in 1839. There are fifty-four important trades flourishing in Burton to-day, the largest of which, the brewing of ale, commenced in 1708. There are sev. breweries in the tn., those of Bass and Worthington covering an area of some 750 ac. The tn. hall, presented to the tn. by Lord Burton, was built in 1894, a modern extension being added in 1938. The corporation owns baths, gasworks, electricity works, omnibuses, markets, libraries, over 1000 houses, a cemetery, and a sewage farm. B. is a quarter-sessions bor., and for parl. purposes is in the B. div. of Stafford.

During the Second World War B. was subjected to four enemy raids, a total of twenty bombs being dropped, which caused eighteen casualties and completely destroyed eight houses. Pop. 46,900.

Buru Island, is. of the Dutch E. Indies, belonging to the residency of Ambonva. Area 3400 sq. m. The surface is mountainous and the seaboard is marshy. The longest riv. is Kajeli. The highest mts.

are in the W., where they reach the height of 8530 ft. Most of the land surface is covered with forests and prairies. The only important exports are cajuput oil and timber. The inhab. are chiefly Malays on the coast, and Chinese and other races in the interior. Pop. about 15,000.

Burujird, important trading centre in Persia, in the prov. of Irak Ajemi. 70 m. S.E. of Hamadan, in fertile Silakhor plain with textile industries and carpet weaving. Pop. 35,000.

Burwood, municipality of New S. Wales, Australia, 7 m. W. of Sydney, on Great S. railway; pop. 16,000.

Bury, co. and parl. bor., is situated 9 m. N. of Manchester in the co. of Lancashire, England. It is 195 m. N.W. of London. Area 7434 ac. pop. 52,500. The tn. is situated on an eminence between the R. Irwell and Roch, and has a mean elevation of about 300 ft. above sea level. The coat of arms depicts four industries, cotton, woollen, engineering, and paper making. In addition, there is a large variety of industry in the tn., including bleaching, calico-printing, dyeing, iron and brass founding, felt manufacturing, hatter, boot and shoe making, and manufacturing of clothing. There are four large and sev. small recreation grounds. It has a new tn. hall. There are two direct grant grammar schools, a secondary grammar school, junior technical school, technical college, and school of arts and crafts. The depot of the Lancashire Fusiliers is in B. Two natives of B., Sir Robert Peel, three times Prime Minister of England, and John Kay, the inventor of the fly-shuttle, are honoured by statues.

Bury, John Bagnell (1861-1927), historian, was b. in co. Monaghan; a son of the Rev. E. J. B., afterwards canon of Clogher. He was educated at Trinity College, Dublin; became prof. of modern hist. at Dublin in 1893, regius prof. of Gk. in 1898, and regius prof. of modern hist. at Cambridge in 1902. His works included a highly esteemed ed. of Gibbon's *Decline and Fall* (1896-1900); eds. of Pindar's *Neemean and Isthmian Odes* (1890 and 1892); and sev. works dealing with the later Rom. empire—the last bringing the hist. down to the death of Justinian. He collaborated in the fourth vol. of *Cambridge Ancient History* which came out in 1926. He d. at Rome.

Bury, Richard de, see AUNGERVILLE, RICHARD.

Buryat Mongolia, autonomous Soviet Socialist republic of R.S.F.S.R., situated S. of the Yakutsk republic, in E. Siberia. It occupies a stretch of country along the frontier between the Soviet Union and the Mongolian People's Republic to the W. of the S. end of Lake Baikal and extends northward between the E. shores of the lake and the Yablonoi Mts., and also along the W. shores (excepting the area round Yakutsk). The coniferous forests which are so universal a feature of E. Siberia are in B. M. confined to the N. part of that country. In the S. they are interrupted by plateau and steppe vegetation, the home previously of Buryats

and Mongols who were almost exclusively nomadic stock-breeders and fishers. Under the Soviet regime a more settled life has replaced the nomadic. Large numbers of the people have joined the *kolkhozy* or collective farms and now dwell in vil. settlements of wooden houses. Even the nomadic herdsmen are organised in 'collective' farms, each of which has great numbers of cows, sheep, horses, and goats. Some of the Buryats and Mongols are fox and squirrel trappers. A state farm has been estab. for sable breeding. Lumbering is also carried on in the forests.

The Buryats early came under the influence of Mongol culture and language and, together with the Mongols, offered a strong resistance to the Russian penetration of their lands in the seventeenth and eighteenth centuries; but the Buryats were gradually forced out of their tribal pasture lands by peasant colonists from Russia. Between the close of the nineteenth century and 1917 the Buryats had lost nearly 5000 sq. m. of land and the pop. declined rapidly. In E. B. M. there was a great influx of lamas from Mongolia, who possessed themselves of large areas of good land. At this time the people of B. M. were entirely illiterate, disease-ridden, and superstitious. But in 1921 two Buryat autonomous regions were formed, and in 1923 these were joined together, and with the Baikal dist. formed into one autonomous republic, with its cap. at Verkhne-Udinsk (now called Ulan Ude). The pop. were, however, very backward, but were much helped in the arts of self-gov. by their Russian neighbours. By 1928 most of the people still remained nomad or semi-nomad. But an improvement began with the development of agriculture and the fisheries, literacy increased and the pop. grew. During the Five Year Plans from 1928 onward the economy of B. M. developed still more rapidly, and by 1937 most rural households were included within collective farms. Industry too expanded, and the nomadic Buryats began to enter the factories. In the second Five Year Plan the Verkhne-Udinsk railway and locomotive works were estab., with a large electric power station. A new modern tn. was built above the Selenga R., with public utility services, hospitals, and schools. There are now in B. M. nearly 500 schools, with about 90,000 pupils and a score of technical colleges and higher educational institutions. Near Lake Baikal there are saw-mills, fish-canning factories, and tin mines. Coal, gold, and manganese are also mined. Tungsten and molybdenum mines and refineries are in operation at Djildinsk (W. of Khatka). Lying between the Kuznetsk industrial region to the W., the new industrial centres of the Far E. and the gold-mining region of the middle Lena to the N., B. M. is an important food-producing region for the urb. pop. of these areas, as well as being a source for the supply of leather, glass, and other commodities manufactured from local raw materials. In 1938 a new railway was built between Ulan Ude (the

pop. of which is now 140,000) and Khatka, on the Mongolian frontier. Pop. 500,000.

Burying Beetles, or *Necrophorus*, constitute a genus of the family of Silphidae. They are known also as carrion and sexton beetles, from their habit of burying small vertebrates by digging the ground from beneath the carcasses until it sinks; the female then lays her eggs in the decaying matter. They make a curious chirping sound by rubbing the abdomen against their wing-cases.

Bury St. Edmunds. Municipal bor. and mrkt. tn. of Suffolk, England, 27 m. E. of Cambridge. It owes its early importance to its famous abbey, which was built to contain the shrine of St. Edmund, king of E. Anglia, who was martyred in 870. Of the monastery there are some remains of the abbey church, 510 ft. long, the chapter-house, two gatehouses, and a bridge. The grammar school was re-founded in 1550 by Edward VI. Within the abbey precincts are the two great fifteenth-century churches of St. Mary, one of the largest in England, and St. James, nearly as large as St. Mary's, which was constituted the cathedral of the diocese of St. Edmundsbury and Ipswich, founded in 1914. Here were born Bishop Gardiner (c. 1483-1555), and Bishop Blomfield of London (1786-1857), and also Sir Nicholas Bacon, the eminent lawyer. Culford school, 5 m. N., is a public school for boys founded in 1881 and transferred there in 1935. The prin. industries are brewing and the manuf. of agric. implements. It is the depot of the Suffolk Regiment. Pop. 18,000.

Busaco, ridge about 1800 ft. high, N. of the R. Mandego, in the prov. of Beira, Portugal. Here the Brit. under Lord Wellington repulsed the Fr. under Massena in Sept. 1810.

Büsbach, tn. with coal mines and woollen manufs. in the Rhineland, Germany. Pop. 9000.

Busbecq, Augier Ghislen de (1522-92), Flemish diplomat and traveller, was b. at Commines, and received a varied education at the univs. of Louvain, Paris, Venice, and Padua. Though he held various offices at the court of Emperor Ferdinand I. and was employed in a series of important negotiations, he is now chiefly remembered for his two visits to the court of Soliman II., sultan of Turkey, at Constantinople. His invaluable letters dealing with these embassies, 1556-62, serve to illuminate the Turkish politics of the time. It seems likely that he intrigued further to embroil the sultan with the shah of Persia in order to stop the former from pursuing his aggressive operations near Constantinople. "It is only the Persian stands between us and ruin," he said; "the Turk would fain be upon us, but he keeps him back." In his journeys eastward he was accompanied by an artist who made drawings of rare animals and plants, and he came back to Europe with a fine botanical collection, besides many MSS. and coins. On his return to Vienna in 1562 he became tutor to the children of Emperor Maximilian II. His *Discourse of the State of the Ottoman*

Empire and his accounts of his travels in Turkey contain material that is of the utmost value to the historian of E. Europe.

Busby, head-dress of the bussars and horse artillery of the Brit. Army. It consists of a fur cap with an upright plume in front and a short bag of the same colours as the facings of the regiment hanging from the top down the right side. The name is also used for the rifle head-dress, a folding cap of astrakhan, and colloquially for the bearskin caps of the footguards and fusiliers. It is conjectured that the name may be of Hungarian origin, and the bag a survival of the Hungarian long padded bag which hung over the right shoulder to ward off sword-cuts; but according to a better opinion the origin of the word is unknown.

Busby, vii. in Lanarkshire, on the White Cart Water, 5 m. from Glasgow. Cotton mill, print-works. Pop. 750.

Busby, Richard (1606-95), noted Eng. schoolmaster, educated at Westminster and Oxford; from 1638 to 1695 he was headmaster of Westminster School; he is said to have educated more distinguished men than any other teacher; among his pupils were Dryden, Locke, Robert South, Atterbury, Henry, and George Hooper. A severe disciplinarian, his name has become a byword for harshness, but he was kind-hearted and charitable to the poor. At the Restoration he was made prebendary of Westminster. His works were mostly school eds. of the classics.

Busch, Julius Hermann Moritz (1821-1899). Ger. author and journalist, was b. at Dresden. He entered the univ. of Leipzig in 1841, and there studied theology and philosophy, but soon drifted into journalism and literature. When about thirty years of age he travelled extensively in America, Greece, Egypt, and Palestine, and pub. the results of his travels. He served under Bismarck, and pub. sev. books concerning the great Ger. statesman. In 1878 he pub. *Graf Bismarck und seine Leute während des Krieges mit Frankreich*, which, as the title indicates, gave an account of Bismarck's doings during the war of 1870-71. This and other writings were incorporated in his important *Life of Bismarck*, first pub. in 1898. In 1899 appeared his *Bismarck: some Secret Pages of his History*. His *Unser Reichskanzler* (1885) dealt mainly with the administration of foreign affairs. He d. at Leipzig.

Busch, Wilhelm (1832-1908), Ger. comic artist and caricaturist, was b. at Wiesenfeld, Hanover; studied at academies at Düsseldorf, Antwerp, and Munich. In 1859 he joined the staff of *Fliegende Blätter*, the leading Ger. comic paper. With Oberländer he was the founder of modern Ger. caricature. In 1865 he pub. the first of a series of humorous illustrated poems—*Max und Moritz*—followed by *Der heilige Antonius von Padua* (1870), *Die fromme Helene* (1872), *Hans Hucklebein* (1872), and others. His humorous drawings and caricatures are very clever, and are notable for their simplicity. The types created by him are familiar in every Ger. household. He enjoys the

same reputation for nonsense rhymes as Edward Lear in our own country.

Busching, Anton Friedrich (1724-93), Ger. geographer and theologian. Prof. of philosophy at Göttingen, 1759; minister of Protestant congregation in St. Petersburg, 1761; went to Berlin, 1766, as a director of a *Gymnasium*. One of the creators of modern geography, his *Description of the Earth* (1754-92) was the most complete and scientific work of the kind, and was trans. into many languages. Wrote also *Magazine of History and Geography* (1767-93); *Biographies of Celebrated Persons* (1783-89); *History of Lutheran Churches in Poland and Russia* (1784-87). See his *Lebensgeschichte* (1789).

Buschmann, Johann Karl Eduard (1805-1880), Ger. philologist, b. at Magdeburg. His philological researches were chiefly concerned with the languages of Central America, among his works being *Ueber die aztekischen Ortsnamen* (1853); *Die Völker und Sprachen Neumexikos* (1858); and *Die Spuren der aztekischen Sprache im nördlichen Mexico* (1859). He was associated in philological work first with Wilhelm von Humboldt, and afterwards with Alexander von Humboldt, assisting the latter in *Kosmos* and other works. He became librarian of the Berlin Royal Library in 1832.

Busenbaum, Hermann (1600-68), Ger. Jesuit, b. in Westphalia. Taught theology at Cologne; rector of Jesuit colleges in Hildesheim and Münster. He wrote *Medulla Theologæ Moralis*, a manual of cases of conscience, which went through forty-five eds., 1645-70. It roused no real opposition till it appeared in Lyons and Cologne, 1716-33; condemned to be burnt by parliaments of Paris and Toulouse, 1757, for countenancing regicide. New eds. appeared later, notwithstanding.

Busch, name, in Australia and S. Africa, for tracts of land covered with brushwood and shrubby vegetation.

Busch Antelope, **Bushtubuck**, or *Tragelaphus sylvaticus*, is a species of horned antelope, but it has not the white stripes common to its relatives. It belongs to S. Africa, and is a member of the family Bovidae.

Bushel (from O.F. *boissel*, Low Lat. *buzellus*, a little box) is a dry measure used for corn, fruit, etc. The Imperial B., instituted in 1826, measures 221.82 cub. in., and holds 80 lb. of distilled water (temp. 62° F.; barometer 30 in.). One B. is equal to one-eighth of a quarter and to eight gallons.

Bushey, civil par. and urb. dist. in Hertfordshire, near Watford. Pop. 11,000. The Royal Masonic Institution here has 400 boys in residence and the Royal Caledonian School was enlarged by two wings in 1927. Sir Hubert von Herkomer, who estab. the local art school in 1882, was buried here in 1914. B. Heath is an eccles. par. formed in 1889. Pop. 2500.

Bushey Park is a royal park on the R. Thames in the S.W. of the co. of Middlesex, England. William IV., when duke of Clarence, was made ranger in 1791, and his recently estab. mistress

Mrs. Jordan, lived there. The famous triple avenue of limes and horse-chestnuts one mile long, was planted by William III. The park contains a national physical laboratory.

Bushido ('military-knight-ways' or 'way of the warrior'), code of honour of the Samurai, or military class, of Japan. It corresponds to European chivalry and had a similarly feudalistic origin, coming first into prominence in the twelfth century. 'Poem-composing pastimes,' according to a sixteenth-century set of rules, 'are not to be engaged in by Samurai.'

Bushire, also written **Bushehr**, **Abu-shehr**, is a prin. seaport of Persia (Iran), situated on the N. shore of the Persian Gulf. It occupies the N. end of a peninsula, and is encircled on all sides except the S. by the sea. The climate is very hot in the summer months, and is unhealthy. The city is deficient in water, and that required for drinking has to be brought from wells two or three miles distant. At a distance the city presents a beautiful appearance, but on closer examination the streets are found to be narrow, filthy, and badly paved. Most of its export trade is with Britain and her colonies. Chief exports are opium, wool, dates, nuts, raw cotton, and cereals. B. is the land terminus of Indo-European telegraph, and the chief station of the Brit. India Steam Navigation Company. B. is on the air line from London to India and has communication by air with Shiraz and Teheran. It was occupied by the Brit. in 1915 during the First World War. At Kishore, in the vicinity, indistinct cuneiform inscriptions have been found, showing that the place was an old Elamite settlement. Pop. 18,000.

Bushman, or **Bosjemans**, nomadic people of S. Africa. Some connection has lately been estab. between the B. and the Pygmy peoples inhabiting forests of central Africa. The most primitive aboriginal race of S. Africa, they were once the only human inhab. of that vast dist., but, driven westward by more advanced later arrivals, they are now found mainly in the barren dists. extending from the inner ranges of the mts. of Cape Province, through the Kalahari desert, and thence to the dists. about the Orambo R., N. of Damaraland. Their language approaches that of the Hottentots, who are, indeed, thought to be a cross between B. and some Bantu-speaking peoples, and is monosyllabic. Its chief peculiarity is the curious 'clicking' sound. In appearance they are of very small stature, with a long and low skull, and large and prominent cheekbones. In complexion they are of a dirty yellow colour. Their only clothing consists of a piece of skin in a triangular form, which is passed between the legs and tied round the waist. The women wear long skin wraps. The dwelling-places of these people consist of low huts made of reed mats, or holes in the earth. Their household utensils are few and roughly made. The ostrich egg-shell is used for carrying water. The people live chiefly by hunting, using for weapons the primitive bow and poisoned

arrows. They eat practically anything, roots, game, insects, snakes, frogs, lizards, and honey being some of their delicacies; also ants' pupae, or 'bushman's rice,' which the women obtain by means of digging sticks. B. are intelligent, musical, and fond of dancing, and are passionate lovers of freedom. There is practically no tribal organisation. Sometimes individual families unite and choose a king, but this is only temporary. They have no concrete idea of God, though their legends indicate a vague belief in an 'All-Father'; they believe in evil spirits and supernatural beings; most B. carry charms. On the



BUSHMAN

E. N. A.

death of a tribesman a pile of stones is reared on the spot and then the whole family deserts the home. Northward the B. appear to improve both in stature and in general condition. There are said to be about 26,000 B. in S. Africa, but it is impossible to gauge their numbers with any certainty. The B. appear to have been the bringers of Palaeolithic culture to S. Africa from N. Africa or perhaps Europe. Their art, examples of which are found engraved in colours on rocks or cave walls in various parts of S. Africa, strikingly resembles the cave paintings perpetuated in E. Spain by Stone Age artists of the Aurignac culture. The art of the B. does not seem to have been practised within the last century. See M. C. Burkitt, *South Africa's Past in Stone and Paint*, 1928; J. Schapera, *The Khasian Peoples of South Africa*, 1930.

Bushmills, small mkt. tn. near the Giant's Causeway, 5 m. E. of Portrush, N. Ireland. Pop. 970.

Bushnell, **Horace** (1802-76), eminent Amer. theologian, was b. at Bantam, Connecticut. He graduated at Yale in 1827, and in 1833 was ordained pastor of the N. Congregational church at Hartford, where he soon became famous on account of his remarkable power as a preacher and

for the depth of his theological writings. He took an active interest in the organisation of the college of California (afterwards a univ.). Some of his chief works are *Christian Nurture* (1847); *God in Christ* (1849); *Nature and the Supernatural* (1858); and *The Vicarious Sacrifice* (1866). For *God in Christ* he was charged with heresy, and unsuccessful attempts were made to bring him to trial. See M. B. Cheney, *Life and Letters of Horace Bushnell*, 1880.

Bushrangers, in Australia, a class of armed robbers, originally consisting of runaway convicts. They were a great scourge in the outlying dists., especially in Tasmania, during the first part of the nineteenth century. In 1815 martial law was proclaimed in this dist., and a determined effort was made to stamp them out. The desperadoes, however, banded together in large gangs, sometimes to the number of fifty, and fought pitched engagements with the police. The drastic Bushranging Act of 1830, renewed in 1834, at last succeeded in rooting them out. The most famous B. were the Kelly gang of four men. In 1879 they held up the vil. of Yerilderie, New S. Wales, but when repeating the exploit in the following year at Glenrowan, in N. Victoria, they were besieged in the hotel and three shot. All were heavy armed. Ned Kelly, the sole survivor, was hanged at Melbourne.

Bush-shrike is the name given to species of Formicariidae, a family of birds found in S. and Central America. The B. resembles the butcher-bird in its method of filling its larder by impaling victims on thorns.

Busris, mythical king of Egypt, and reputed founder of Thebes. A seer told him he could only avert famine by sacrificing a foreigner yearly to Zeus. He commenced by sacrificing the seer, and afterwards seized Heracles for this purpose, but was himself slain by the hero.

Busk: 1. tn. of Ukraine in the region of Tarnopol, in a marsh by the R. Bug. Its numerous bridges cause it to be humorously styled the Galician Venice. Pop. 6000, of whom 1500 are Jews. 2. Tn. of Siberia with a pop. of 46,000.

Busk, Hans (1815-82), one of the chief originators of the volunteer movement. He was educated at King's College, London, and Trinity College, Cambridge. Called to the Bar in 1811; made high sheriff of Radnorshire in 1847. He founded a rifle club at the univ. and lectured on the volunteer movement. He helped to revive the Victoria Rifles. He was also familiar with naval construction, and was the first to advocate the estab. of life-ship stations. He helped to found the School of Cookery at Kensington.

Buskin, half-boot or high shoe lacing tight to the leg; in particular the thick-soled *calthurnus* used by anct. tragic actors in order to increase their height, in which sense it is opposed to *soccus* (sock), the light shoe worn by actors of comedy.

Busoni, Ferruccio Benvenuto (1866-1924), It. composer and pianist; his father was a clarinet player and his mother a

Ger. pianist. He first appeared in public at the age of seven, at Vienna. He studied there under Hans Schmidt, and under Meyer-Remy at Graz. When he was seventeen a gold medal in his honour was struck at Florence, and the Accademia Filarmonica of Bologna elected him a member. At the age of twenty he removed to Leipzig to devote himself to composition; in 1889 he accepted a post as teacher at Helsingfors; and in 1890, after winning the Rubinstein prize, he was prof. at the Moscow Conservatoire for a year. In 1891-93 he taught in the New England Conservatory at Boston. He then took up residence in Berlin, but made extensive concert tours, and was in the U.S.A. again 1910-11. As a pianist B. was considered to have the most powerful individuality and greatest technical mastery since Liszt and Rubinstein. As a composer the art of his earlier years is summed up in the monumental piano concerto, op. 34, which is notable for its grandeur of construction and wealth of musical invention. His style is neo-classical in the best sense of both words. It is a synthesis of composers as disparate as Bach and Rimsky-Korsakov. Specimens of his neo-classical style are to be found in his later sonatas, the *Divertimento* for flute and orchestra, *Sarabande* and *Corlège* from the *Faust* music. In dramatic art, he selected for treatment supernatural subjects, myths, or fantasies. *Die Brautwahl* (first performed 1912) takes its plot from a fantastic tale by E. T. A. Hoffmann; *Turandot* is from Gozzi's drama, and this and his *Alechinò* (1918) belong to the old It. *commedia dell'arte* (q.v.). His third opera, *Doctor Faust*, was completed in 1924. He also wrote much orchestral and chamber music. B. was in the fullest sense both pianist and musician. Some rate his compositions very high and think that the rest of the world underestimates them. He wrote a number of essays which were collected under the title *Von der Einheit der Musik*. See life by E. J. Dent, 1925.

Buss, Frances Mary (1827-84), pioneer of higher education for girls. Founded the N. London Collegiate School.

Bussa, or Bussang, see BOUSSA.

Bussanga, see BORGU.

Bussirhat, see BASUTUAT.

Bussora, see BASRA.

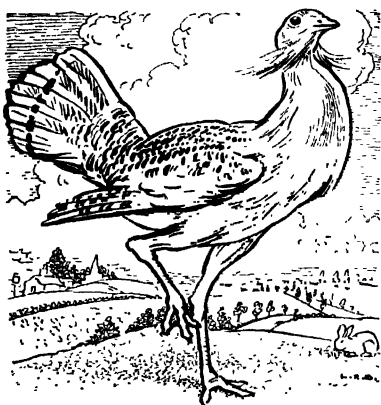
Bussy, Roger de Rabutin, Comte de (1618-93), Fr. writer, b. at Epiry; entered the army and fought in sev. campaigns, and became notorious for his affairs of gallantry. In 1659 he was banished from the court; he then wrote for the amusement of his mistress the *Histoire amoureuse des Gaules*. This gave offence to the king and B. was sent to the Bastille, from which he was only liberated on condition that he retired to his estates. Here he wrote his *Mémoires* and *Correspondance*.

Bust (from Fr. *buste*, It. *busto*, origin unknown) is a head and shoulders representation of a person carved in the round. The Gks. used to carve ideal Homers and Sapphos, but the B. of Pericles is almost the earliest authenticated portrait. Life-like Bs. of the Rom. emperors, most of

them set on a pedestal, may be seen at the Brit. Museum. A B., of course, may be carried out in any material: marble, bronze, etc.

Bustamite, variety of the mineral rhodnite (MnO.Sb_2). B., in addition to the silica and manganese, contains also from 9 to 15 per cent of lime. It is greyish-red in colour and crystallises in the triclinic system.

Bustard is a word derived from the Lat. *avis, bird, tarda*, slow, and is applied to the family Otididae. *Otis tarda*, the great B., is now found only in S. Europe, Morocco, and as far E. as Persia, but



BUSTARD.

was formerly the largest land-fowl of Britain. The male bird measures about 8 ft. across the wings and 1 ft. from its bill to its tail. It has been extinct in England since 1838.

Busti, see **BASTI**.

Busto Arsizio, tn. of N. Italy, situated 20 m. N. of Milan. It has an interesting old church and manufs. cotton thread. Pop. 28,000.

Butadiene, in chem. a di-olefinic hydrocarbon, which occurs in cracked petroleum and in the gases therefrom. Formula, $\text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2$. It can be obtained synthetically, but is made in the laboratory by the thermal decomposition of fusel oil. It has been used for making synthetic rubber.

Butan, see **BHUTAN**.

Butane, name of two hydrocarbons having the formula C_4H_{10} . B., $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$, is an inflammable gas with boiling point 1°C , and isobutane, $(\text{CH}_3)_2\text{CHCH}_3$, is a gas of similar properties with boiling point about -11.5°C .

Butcher, Samuel Henry (1850-1910), classical scholar, was b. in Dublin, a son of Samuel B., bishop of Ncath. He was educated at Marlborough and Cambridge, and in 1882 succeeded Blackie as prof. of Gk. at Edinburgh, resigning in

1903. He was a Unionist M.P. for Cambridge Univ. from 1906 till his death. He collaborated with Andrew Lang in a translation into Eng. prose of Homer's *Odyssey* (1879). His works include *Some Aspects of the Greek Genius* (1891); *Aristotle's Theory of Poetry and Fine Art* (1895).

Butcher-birds, see **SHRIKES**.

Butcher's Broom, or *Ruscus aculeatus*, is a European species of Liliaceae which grows as a shrub in Britain. It is noted for its curious branches, which are phylloclades arising in the axil of a small scaly leaf. The phylloclade resembles a flattened leaf in the middle of which the flowers are borne in the axils of minute scaly leaves. The flowers are declinous, and the fruit is a berry.

Bute, John Stuart, third Earl of (1713-1792), was the son of the second earl of Bute, and of a daughter of the first duke of Argyll. He was b. on May 25, 1713, and succeeded to the title in 1723. He was elected as a representative peer of Scotland in 1737, but made no stir in the political world, and retired to his home in Bute, where he lived until, after the '45, he took up his residence in England. His introduction into a prominent part in Eng. court life was practically accidental. He was called upon to perform some trivial service for the Prince of Wales in a moment of emergency, and immediately became a great friend of the prince and princess. After this date, 1747, he was constantly in attendance on the Prince of Wales, and had great influence with him. On the death of Frederick his influence over the young Prince George was very great, and it was he who instructed the prince on the lines of Bolingbroke's patriot king and gave him his extravagant ideas of the powers and duties of the kingship. Between the year 1756 and 1760 he took a very active part in political negotiations, but was practically a political non-entity save for his influence when the death of George II. raised him to a position of permanent importance as the confidant of the new king in 1760. He immediately began to carry out the policy in which he had already instructed George III., of making the king of overwhelming importance, of lessening the authority of Parliament, and of breaking the Whig oligarchy. His methods were effective even though they were not on the surface apparent; the internal jealousies of the Cabinet were used to spread disruption. Pitt resigned, B. was given a place as secretary of state, and in 1761 he also became Prime Minister. The king and he desired peace with France; Pitt in 1761 had declared in favour of war with Spain, and on the refusal of the king to declare war had resigned. The desire for peace, the resignation of Pitt, and his own nationality, all combined to make B. unpopular. He was attacked in the street and his coach destroyed, a jack-boot and a petticoat (to represent the queen) were continually being burnt. He was scurrilously attacked in the press and by cartoons, his relationship with the princess mother was made the subject of vile scandals, in which there

was not an atom of truth, and to crown everything, in 1762, he was forced to declare war with Spain. Still he hurried on negotiations with the enemy for peace, and the desertion of his ally, Frederick the Great, was simply unforgivable, nor was it forgiven by Frederick. He was made a K.G., and in 1763 peace was made at Paris. Bribery and corruption had by this time obtained for him a majority in the House of Commons, but he still aroused the bitterest hostility by his policy, and he still continued his attacks upon the Whig oligarchy. Everywhere he was attacked, and the attacks did not spare him in any way; it is, in fact, safe to ignore the majority of the charges of malpractices which have been brought against him from so many sources. In April 1763, so bitter had the attacks become, and so much were they felt by B., that he resigned. He still attempted to retain his influence over the king, but was forced by Grenville to retire, and finally Grenville extracted a promise from the king that the influence of B. at court should cease, and after 1765 he had no longer any power over the king, resigning his positions and having his influence taken from him. He still took some slight interest in politics, and was again on two occasions a representative peer of Scotland, but he spent the greater part of the rest of his life in travelling, and *d.* in 1792, being buried at Rothsay in the is. of Bute. He was totally unfitted for the position which he had occupied, but in his desire to serve the king there was no more loyal subject. But his administration was one of the worst that have ever been known in Eng. politics, and indeed depended for its support entirely upon the confidence of the king and the corruption of Parliament. His family life, however, was above reproach, and by a circle of intimate friends he was greatly and justly admired.

Bute Island, in the firth of Clyde, separated from Argyllshire by the Kyles of Bute, a narrow channel less than 1 m. wide. The is. is 5 m. distant from the Ayrshire coast, and 6 m. from Arran. It is 16 m. long and 3 to 5 broad. The coast is rocky, and in the interior are sev. small lochs, the prin. of which are Lochs Fad, Aecog, and Quien. The soil is light and gravelly, but produces excellent crops. There is no lack of soft red sandstone, slate, and whinstone, while grey granite is also found. The is. is celebrated for its salubrious climate, which makes it a favourite resort of invalids. Pop. 19,500. Rothsay, a popular seaside resort, is the chief tn. Mt. Stuart, 4 m. S. of Rothsay, is a seat of the marquess of Bute.

Butea is a genus of leguminous plants named after John, earl of Bute; the four species are natives of India and China. *B. frondosa*, the dhak, palas-tree, or bastard teak, is a native of mountainous dists. of Hindustan, and is noted for its great beauty. It yields lac and a bright red astringent juice known commercially as E. Indian kino, while the flowers yield a bright yellow dye. *B. superba* grows on the mts. of Coromandel.

Butera, tn. of Sicily, in prov. of Caltanissetta. Pop. 7500.

Buteshire, co. of Scotland, comprising the is. of Bute, Arran, Great and Little Cumbrae, Holy Isle, Pladda, and Inchmarnock. Area 220 sq. m. Pop. about 18,000. The people are chiefly agriculturalists, oats and potatoes being the prin. crops. Fishing and cattle rearing are other activities. The tns. and vils. are much favoured as holiday resorts. The is. were taken from the Norwegians by Alexander III., king of Scotland.

Butler, city of Pennsylvania, N. of Pittsburgh, U.S.A., with coal and oil fields. Pop. 24,000.

Butler, Alban (1711-73), the hagiographer, was b. in Northamptonshire, and at an early age was sent to college at Douay, where he became prof. successively of philosophy and divinity. He was sent subsequently on the Eng. mission, and was some time chaplain to the duke of Norfolk. At length he became president of the college of St. Omer. The chief of his works is *Lives of the Fathers, Martyrs, and other Principal Saints*. It cost him the labour of thirty years, and first appeared in five vols. in 1756-59. On account of B.'s strong eccles. bias and defect of scholarship and critical sagacity, his works cannot be regarded as authoritative.

Butler, Benjamin Franklin (1818-93), lawyer and soldier, was at one time one of the most execrated men in the S. commonwealths of the U.S.A., owing to his conduct during the Civil war. He was b. at Deerfield, New Hampshire, Nov. 5. On the death of his father, he removed to Lowell, Massachusetts. He was admitted to the Bar in 1840, and became noted as a criminal lawyer. He served in the Lower House of the State Legislature in 1853 and in the State Senate in 1859, being at that time a Democrat. When the Civil war broke out, he became a volunteer officer in the Union forces, and in 1862 led an expedition against the great S. seaport tn. of New Orleans, which he captured on May 1. As commander in charge of this big city, his rule was marked by the utmost severity. For neglecting orders given him by Gen. Grant in the attack on Fort Fisher, near Wilmington, he was removed, and that ended his military career. He returned to Massachusetts, and was sent as Republican Congressman to Washington from 1867 to 1878, except in 1875-77. He was elected governor of the state in 1882.

Butler, Charles (*d.* 1617), miscellaneous writer, was a native of Buckinghamshire, and was educated at Oxford. He spent most of his life at Basingstoke, first as a schoolmaster and afterwards, for nearly fifty years, as vicar of Wootton St. Lawrence, 3 m. from the tn. He wrote a work on bees (1609); a treatise on affinity as a bar to marriage (1625); a Lat. treatise on rhetoric (1629); a work on Eng. orthography (1633); and *The Principles of Bi-sick in Singing and Setting* (1638).

Butler, Charles (1750-1832), Brit.

lawyer and writer. He was educated at Douay, and in 1775 entered Lincoln's Inn. In 1791 he was the first to be called to the Bar under the terms of the Catholic Relief Act. He took silk in 1832, in which year he also d. He was a most prolific writer. Amongst the books, about fifty in number, which he pub., may be mentioned *Coke upon Littleton's Laws of England* (1775); *Reminiscences* (1821-27); *Book of the Roman Catholic Church* (1825).

Butler, Lady Eleanor (c. 1745-1829), lived in seclusion with Miss Sarah Ponsonby (1755-1831), at Plasnewydd in the vale of Llangollen for over fifty years. They were known as 'The Maids of Llangollen,' or 'The Ladies of the Vale,' and were visited by many distinguished people. Lady Eleanor belonged to the Irish house of Ormonde, and her brother succeeded to the earldom in 1791.

Butler, Elizabeth Southerden, Lady (1844-1933), Eng. artist, a daughter of T. J. Thompson and a sister of Mrs. Meynell, was b. at Lausanne, Switzerland. In 1877 she married Lt.-Gen. Sir Wm. Francis B. He d. in 1910. In early life she spent some years in the study of art at Rome and Florence. She exhibited 'Missing' at the Royal Academy in 1873, and this was followed by a succession of successful pictures, dealing chiefly with military subjects. Among them were 'The Roll Call' (1874); '28th Regiment at Quatre Bras' (1875); 'Balaklava' (1876); 'Inkerman' (1877); 'Scotland for Ever' (1881); 'Floreat Etona' (1882); 'Tel-el-Kebir' (1885); 'Evicted' (1890); 'A Cistercian Shepherd' (1908). She pub. *Letters from the Holy Land* (1903); *From Sketchbook and Diary* (1909); *An Autobiography* (1923).

Butler, Frances Anne, see KEMBLE.

Butler, George (1774-1853), headmaster of Harrow and dean of Peterborough, was b. at Pimlico, London, in 1774. Educated at Cheyne Walk School, Chelsea, and Sidney Sussex College, Cambridge. Elected a fellow of the college and acted for some time as mathematical tutor. In 1805 he became master of Harrow School, retaining this position until 1829. He then retired to his living at Gayton, Northamptonshire, and was appointed dean of Peterborough in 1842. He was a great mathematician, a distinguished classical scholar, and spoke sev. languages fluently. His later years were years of physical suffering. He d. at Peterborough. Chief works are *Extracts from the Communion Service of the Church* (1839) and *Statutes of Peterborough Cathedral* (1849).

Butler, Henry Montagu (1833-1918), Eng. clergyman and schoolmaster, was b. at Gayton, Northamptonshire, July 2. He studied at Trinity College, Cambridge, and was headmaster of Harrow School, 1859-85. In 1885 he was made dean of Gloucester, and in 1897 appointed honorary canon of Ely. In 1886 he became master of Trinity College, Cambridge, being vice-chancellor in 1889 and 1890. Among his pub. works are various sermons reprinted from 1866 onward, including *Belief in Christ*, and other Sermons

preached in the Chapel of Trinity College, Cambridge (1898) and *Public School Sermons* (1899)—also: the Romanes lecture for 1912, *Lord Chulham as an Orator*, and *Some Leisure Hours of a Long Life* (1914).

Butler, James, see ORMONDE, DUKES OF.

Butler, Joseph (1692-1752), Eng. divine, was b. at Wantage on May 18, being the son of a linen draper of that tn. His father was a Presbyterian, and Joseph was educated with the ultimate object of entering the Presbyterian ministry. He received his education at Gloucester and Tewkesbury. Whilst at the latter academy B., being dissatisfied with the principles of Presbyterianism, joined the Church of England. He entered Oriel College, Oxford, 1715. He took his degree in 1718, and was immediately appointed preacher at the Rolls Chapel, and was rapidly advanced in the Church, being given the living of Stanhope by Talbot, bishop of Durham, with whom he had been on terms of great friendship at Oxford. He resigned the readership of the Rolls Chapel in 1726, but it was while he was there that he preached his famous fifteen sermons. For some years, from 1726, he lived in practical retirement at Stanhope. In 1733 he was made chaplain to the lord chancellor, and in 1736 prebendary of Rochester, whilst in the same year he was attached to the service of the queen. In 1737 Queen Caroline d., and B. was appointed bishop of Bristol, then the poorest see; in 1740 he was made dean of St. Paul's (one of the richest deaneries in England), in 1748 clerk of the closet to the king. There is some evidence for the statement that in 1747 he was offered the primacy, which he declined. In 1750 he accepted the bishopric of Durham, and in 1752 he d. He was buried at Bristol, where so much of his life had been spent. In 1736 had appeared his great work, *The Analogy of Religion*. See Works, ed. J. H. Bernard, 1900.

Butler, Josephine Elizabeth (1828-1906), author and social reformer, was the daughter of John Grey of Dilston. In 1852 she married Dr. George B. (q.v.), a strong advocate of women's rights. She was at first chiefly interested in the movement for the higher education of women, but afterwards directed most of her energies to the reclamation of 'fallen' women. She took a prominent part in the campaign for the repeal of the Contagious Diseases Acts (1864, 1866, 1869; repealed 1883-86), which she held unjustly affected women, and she initiated a movement for the suppression of the White Slave traffic.

Butler, Nicholas Murray (1862-1947), Amer. authority on education, was b. at Elizabeth, New Jersey, son of Henry L. B. He was at Columbia College, 1878-1882; was fellow in philosophy there 1882-84, visiting Berlin, Paris, and Oxford, and returning to Columbia College as instructor in philosophy. He became prof. and first dean of the faculty of philosophy, ethics, and psychology in 1890, when the college was made a univ., of which he became president in 1901. He was the founder and first president of

the college for the training of teachers at New York. He founded the *Educational Review* in 1889, and ed. it until 1920. In 1912 he was candidate for the Republican nomination for vice-president, and in 1920 he was presented by the State of New York for the presidency of the U.S.A., but failed in both instances. He pub. various works on education, upon which subject he held the cultural as opposed to the vocational view. By his conduct of the affairs of Columbia Univ. for forty years he raised that institution and himself to a high position of independence and authority. He became a member of the Institut de France in 1923, and chancellor of the Amer. Academy of Arts and Letters in 1924. He was awarded the Nobel Peace Prize in 1931. He received the honorary doctorate of at least twenty-six univs., including Oxford, Cambridge, and Manchester. His publs. include *The Meaning of Education* (1898, 1910); *True and False Democracy* (1907); *Philosophy* (1911); *The International Mind* (1913); *Building the American Nation* (1923); *The Family of Nations* (1938); and an autobiography, *Across the Busy Years* (1939).

Butler, Samuel (1612-80), author of *Hudibras*, was a Worcestershire farmer's son. After being for some years page in the household of Elizabeth, countess of Kent, he became clerk to sev. Puritan justices of the peace, some of whom are believed to have suggested characters in *Hudibras*. Sir Samuel Luke, one of these justices, is supposed to be the original of Hudibras. In 1662 he was steward of Ludlow Castle. Aubrey, who describes him as 'strong-set, high-coloured, a head of sorrel hair, a severe and sound judgment; a good fellow,' lends no support to the stories of his neglect at court and miserable end. His *Hudibras* (pub. in three parts, 1663, 1664, and 1668) is a satire on the Puritans, and while it ridicules the extravagances into which many of the party ran, it entirely fails to do justice to their virtues and their services to liberty, civil and religious. Charles II. is said to have enjoyed the pungency of its wit, and the resistless power of its railleries, but, notwithstanding the contemporary popularity of the work, B. was neglected by the court and *d.* in poverty. Like Pope, B. is now more quoted than read. No doubt the story is but a bare framework, yet his mastery over rhyme and epigram, and his genius for making his characters depict themselves in the most contemptible light, form a splendid embroidery. Works: R. B. Johnson, *The Poetical Works*, 1893; A. R. Waller and R. Lamar, *The Collected Works*, 1905-28. Lives: J. Aubrey, in *Brief Lives*, 1898; J. Veldkamp, *Samuel Butler*, 1923.

Butler, Samuel (1774-1839), classical scholar, was educated at Rugby and St. John's College, Cambridge. At college his brilliance gained him many medals and prizes. In 1793 he secured the Craven scholarship with Samuel Taylor Coleridge and Keats, afterwards headmaster of Eton, as rival competitors. Three years

later he was senior optime in the mathematical tripos. From 1798 to 1836 he was headmaster at Shrewsbury School, which obtained a high reputation for scholarship and excellence of moral tone. His preferences in the Church were the living of Kenilworth, 1802; a prebendaryship of Lichfield, 1807; and the bishopric of Lichfield, 1836. His elaborate ed. of *Æschylus* was pub. 1809-26.

Butler, Samuel (1835-1902), Eng. author, b. Dec. 4, at Nottingham, son of the Rev. Thomas B., and grandson of Dr. Samuel B., headmaster of Shrewsbury and later bishop of Lichfield. B. was educated at Shrewsbury and St. John's College, Cambridge; he prepared for ordination but doubts led him to give up the idea, and in 1859 he went to New Zealand and became a sheep-farmer. *A First Year in Canterbury Settlement* (1863), composed of letters home, was his first publication, but he himself regarded *Erewhon* (1872) as his debut in authorship. A few passages in *Erewhon* are taken from *A First Year*, a few of its ideas from articles and letters by B. in the New Zealand press, and the Erewhonian scenery is drawn from that of New Zealand. *Erewhon* ('Nowhere' backwards) is a Utopian satire, depicting a people with customs and practices often the opposite of ours; thus machines have been abandoned out of fear that they may become masters of men, and crime is treated as illness, illness as crime. *Erewhon* shows a remarkable insight into the development of some phases of twentieth-century society, and its qualities of invention, wit, and grace, as well as its original ideas, have estab. its place among great satirical romances, together with its sequel *Erewhon Revisited* (1901). The latter work is a more polished story than *Erewhon*, and its dominating theme, the origins of a religious myth, gives it more cohesion; but it has not quite the spontaneity of the first work. Between these two books B. pub. at his own expense (for he was a commercially unsuccessful author) sev. works on a variety of subjects, but his posthumously pub. novel *The Way of All Flesh* (1903) overshadows all these. This autobiographical novel embodies some of his favourite notions, notably those on the causes and effects of the clash between generations; the painful relations between Ernest of the novel and his father, the Rev. Theobald Pontifex, are modelled on those of B. and his father, and sev. characters had their prototypes in real people in B.'s life. He began writing the novel in 1873, more or less at the instigation of Miss E. M. A. Savage, who read it in MS. as it progressed until 1885, when she *d.* and B. ceased work on it. Two sonnets on Miss Savage, whose opinion he took on his writings throughout their friendship, were printed in H. F. Jones's *Memoir*. It was following the pub. of *The Way of All Flesh* that B.'s work found an appreciative public. Bernard Shaw's note in the preface to *Major Barbara* having no doubt something to do with this: 'When I produce plays in which Butlers'

extraordinarily fresh, free, and future-piercing suggestions have an obvious share, I am met with nothing but vague cacklings about Ibsen and Nietzsche. . . . Ideally the English do not deserve to have great men." Shaw has acknowledged his indebtedness to B.'s theory of creative evolution as opposed to fortuitous natural selection, a theory expounded by B. in four straightforward books which followed *Erewhon: Life and Habit* (1878); *Evolution, Old and New* (1879); *Unconscious Memory* (1880); and *Luck or Cunning?* (1887), all concerned in controversy with Darwinism and the middle two involving a personal quarrel with Charles Darwin. These books have never been widely read, yet they have much of B.'s courage and humour, as indeed have his other writings, which include *The Fair Haven* (1873) ('a work in defence of the miraculous element in our Lord's ministry upon earth, both as against rationalistic impugnors and certain orthodox defenders'—an ironical 'defence' issued as by the late John Pickard Owen, with a delightful imaginary memoir of the author); *Alps and Sanctuaries of Piedmont and the Canton Ticino* (1881); *Ex Voto, an Account of the Sacro Monte at Varallo-Sesia* (1888); *The Life and Letters of Dr. Samuel Butler his grandfather* (1896); *The Authorship of the Odyssey* (1897); *Shakespeare's Sonnets reconsidered and in part re-arranged* (1899); and *The Iliad and The Odyssey rendered into English Prose* (1898 and 1900 respectively). To the wide range of B.'s interests, painting and music should be added. When he first returned from New Zealand he took up painting seriously, studying at Heatherley's art school and exhibiting at the Royal Academy, where his painting 'Mr. Heatherley's Holiday' (now in the National Gallery) was shown in 1874. He was an unsuccessful candidate for the Slade professorship of fine art in 1886. Ten years after B.'s death was pub. *The Note Books of Samuel Butler* (1912), now, after *Erewhon* and *The Way of All Flesh*, his best-known book. Ed. by his friend, Henry Festing Jones, the pub. note-books give a classified selection of B.'s carefully kept personal memoranda in which he recorded everything he wanted to remember of experiences, conversations, ideas and opinions, quips and jests. *The Note Books* also include his hitherto privately printed *Seven Sonnets* and a *Poem of Montreal*. B. never married. From 1864 until the end of his life he lived in rooms at 15 Clifford's Inn, London, attended by his servant-secretary Alfred Cathie, and spending a part of almost every day in the Brit. Museum reading-room. He d. on June 18, 1902. Collected ed. of B.'s works, ed. by H. F. Jones and A. T. Bartholomew, 20 vols., 1923-26. See G. Cannan, *Samuel Butler, a Critical Study*, 1915; H. F. Jones, *Samuel Butler, a Memoir*, 1920; G. E. M. Joad, *Samuel Butler*, 1924; A. J. Hoppé, *A Bibliography of Samuel Butler*, 1925; Mrs. R. S. Garnett, *Samuel Butler and his Family Relations*, 1926; G. D. H. Cole, *Samuel Butler*, 1947; P. N. Furbank, *Samuel Butler*, 1948.

Butler, Sir Spencer Harcourt (1869-1938), Anglo-Indian civil servant. Educated at Harrow and Oxford Univs. Entered Indian civil service 1888. As deputy-commissioner of Lucknow he inaugurated many tn.-planning improvements and much reconstruction in the ant. cap. of Oudh, where, as also in Rangoon, a statue was raised to him by public subscription. In 1915 he became lieutenant-governor of Burma and, later, became lieutenant-governor of the United Provs., being designated governor when the diarchical system provided by the Act of 1919 came into operation. In 1923 he returned, as governor, to Burma, and in 1925 made a journey into the region of the Negas with the aim of ending slavery and human sacrifice there, near the Hakkawang valley. Chairman of the Indian States Committee, 1927. Pub. *India Insistent* in 1931.

Butler, or Buttler, Walter, Count (c. 1600-34), Irish adventurer, was descended from the third earl of Ormonde. He was present at the battle of Prague (1620), and accompanied James B., a kinsman, on his march to Frankfurt-on-Order (1631), at the siege of which he greatly distinguished himself. He then served under Wallenstein, and he was an accomplice in the murder of Wallenstein at Eger in 1634. For his share in this affair he was ennobled by the emperor.

Butler, William Archer (c. 1814-48), prof. of moral philosophy in the univ. of Dublin, was b. at Annerville near Clonmel. He was brought up as a Rom. Catholic, but became a Protestant. Educated at Clonmel School and Trinity College, Dublin, he joined the College Historical Society, and was appointed first prof. of moral philosophy at Dublin Univ. During the horrors of famine and pestilence in 1846-47 he laid aside all higher pursuits and toiled nobly among the poor as relieving officer. His chief works are *Sermons Doctrinal and Practical* (1855-1856); *Lectures on the History of Ancient Philosophy* (1856); *Letters on Romanism* (1858).

Butler, Sir William Francis (1838-1910), Brit. general, b. at Suirville, Tipperary. Educated at Dublin, he entered military service in 1858. Served in the Ashanti expedition in 1873, in Natal, 1879, and in the Sudan campaign of 1884-85. He was brigadier-general in Egypt until 1892, when he was promoted to the rank of major-general and stationed at Aldershot. He succeeded Gen. Goodenough as commander-in-chief in S. Africa in 1898. He acted as high commissioner during Sir A. Milner's absence in England. Before the outbreak of war B. was recalled because he expressed views on the subject of probabilities of war which were not approved of by the home gov. He married, in 1877, Miss Elizabeth Thompson (see BUTLER, ELIZABETH). He pub. *The Great Lone Land* (1872) and other works, and was the biographer (1890) of Sir George Colley. His *Autobiography* was pub. in 1911.

Butlerage was an ant. right of the Crown to buy up provisions and other

necessaries for the royal household at a valuation, even without consent of the owner. From this probably originates the custom of taking dues in return for protection of ports and harbours. B. ceased to be levied in 1809.

Buto, Egyptian goddess, whose earlier name of *Uto* became confused with the name of the city of B., in the N.W. of the Nile delta, where she was held in special honour. She was a 'cobra-goddess of the marshes,' and identified by the Gks. with *Leto*.

Butomaceæ is a very small order of monocotyledonous plants found in marshes of tropical and temperate lands. The flowers are regular, hermaphrodite, with two whorls of three in the perianth, nine to numerous stamens, six to numerous carpels, with numerous ovules. The inflorescence is usually an umbel and the fruit is a follicle.

Butomus, *Butomus umbellatus*, flowering rush, is the single species of its genus in the order Butomaceæ. It grows in Europe and Asia, and is accounted the handsomest herbaceous plant of the Brit. flora. The flowers are rose-coloured and the leaves are sword-shaped.

Buton (Dutch *Boeton*) Island, is. of the Malay Archipelago, separated from the S.E. ray of the Celebes and the is. of Muna by a narrow strait. It is high and wooded, and produces timber, rice, sago, &c. The pop. are Malays, mostly Buris (q.v.); the area is 1700 sq. m. Pop. 18,000.

Bütow, tn. in the prov. of Pomerania, Germany, 77 m. E. of Kolberg. Pop. 10,000.

Butrinto, small fort. tn., opposite Corfu, on the coast of Albania. Lake Vivari lies to its N. It has a little harbour, and is the seat of a Gk. bishop. The Venetians held the tn. till 1797, when it was occupied by the Fr., who in their turn gave it up to the Turks in 1799. The ruins of Butthrotum, a Rom. colony mentioned by Strabo, lie near at hand. They include a mile of old Rom. wall. Pop. about 2000.

Butt, measure of ale or wine. A B. of ale is usually 108 gallons, a B. of wine 126 gallons.

Butt, Dame Clara (1873-1936), contralto singer, was b. at Southwick, Sussex. She was trained in the Royal College of Music, and made her debut in Dec. 1892. One of the most conspicuous of her many successes was in Elgar's *Sea Pictures* (1899), specially written for her. In 1900 she married Kennerley Rumford, baritone vocalist, with whom she appeared on many concert platforms throughout the country. In 1917, on account of the devotion of the proceeds of her many concerts to war charities, she was made a dame of the Brit. Empire. D., after a long illness, at Oxford.

Butt, Isaac (1813-79), leader of the Home Rule party in Ireland, was b. in Donegal; educated at Trinity College, and took his degree with high distinction in 1835. In 1836 he was appointed prof. of political economy and was called to the Bar in 1838. He was a Conservative

in politics, and in 1852-65 was M.P. for Youghal. He changed his political opinions, and on his election for Limerick in 1871 he became leader of the Home Rule party. A Home Rule League was formed, but lasted only a short time. He lost hold on his associates, and was called a Tory in disguise and a traitor. His constitutional policy was abandoned by his successor, Parnell.

Butte, city and co. seat of Silverbow co., Montana, U.S.A., on the W. slope of a range of the Rocky Mts. Near it is the famous Anaconda copper mine, and B. produces about one-third the entire copper output of the States, besides producing large quantities of gold and silver. It is on five railways. Pop. 37,000.

Butter, article of food consisting of the fatty substances present in milk, together with some of the other constituents and a small proportion of salt. The general process by which B. is made involves separating the cream or fatty matter from the milk and churning the cream until the fat globules are burst and the fat particles adhere together in a fairly solid mass. The variations in particular methods consist in the employment of more or less elaborate machinery in the different details of the process, and the extent to which bacterial action is artificially aided. Cow's milk contains, on the average, about 3.75 per cent of fat, but the amount varies with the breed and individual, with the season of the year, and even with the day of the week—Monday's milk being usually deficient in fat as compared with the rest of the week, while the fat in Tuesday's milk is usually above the average. The fat is present in the form of globules varying in diameter from .0016 mm. to .01 mm. At temps. above 32° C. the fat is in a liquid condition, and slowly solidifies as the temp. is lowered. The gradual nature of the solidification is shown by the slow increase in the sp. gr. of the milk due to that solidification. As milk is cooled, therefore, the fat tends to rise to the surface, because the density of the serum or liquid portion of the milk increases practically in proportion to the decrease in temp., while the fat, being for the most part still in the liquid condition, has not increased in density in the same proportion. The most widespread manner of separating cream from milk is therefore to allow the liquid to stand in shallow pans in a cool room for about a day, when the particles of fat slowly ascend to the surface as the effect of the differing densities. This method is not only slow, but is also not economical, because a fair proportion of fat still remains in the skim milk. Various types of mechanical cream-separators are now widely used. The general principle underlying the action of all these machines is the same. The milk is swirled round a central feeding tube, so that the heavier constituents are projected by centrifugal force to the outer portion of the chamber, while the lighter fat may be collected at a point near the centre of the rotating piece. Milk placed in a separator at or above blood-heat is resolved into cream and

skim milk in a few minutes. The next operation is known as 'ripening,' and consists essentially in allowing the multiplication of lactic bacilli in the cream. The object of this process is to produce a more palatable article, and to shorten the operation of churning, as it is found that B. more readily forms in the churn when ripened cream is used. The popular and primitive method of ripening is to allow the cream to stand in a cool room, with occasional stirring, until the practised taste of the dairyman indicates that the process has sufficiently advanced. The work is expedited, however, by using a 'starter.' This consists of a pure culture of the lactic acid bacillus, and is stirred into milk which has been sterilised and brought to a temp. of 80° F. This temp. is maintained until the milk has become sour, when a portion is added to cream that needs ripening. In either method care must be taken to prevent other bacteria from having access to the cream. To this end all vessels and utensils are scalded before use, moistened muslin curtains are used to entrap dust, and the utmost cleanliness is enforced in all branches of the dairy work. When the cream has sufficiently ripened, it is placed in a churn and agitated until the B. forms. Many varieties of churns exist, both of the kind in which a number of blades are dashed or revolved in the contained cream, and of the kind where the vessel itself is turned end over end, the churning consisting in the liquid dashing against the sides of the vessel. The forming of the B. can easily be recognised by the different sound of the 'splash,' or by the different effort required if the churn is actuated by hand. After churning, the buttermilk has to be washed from the butter with cool water, and the solid product then presents an attractive granular appearance. To rid it of the excess of water, and incorporate the desired amount of salt, it is necessary that the B. should be 'worked.' This may either be done by hand, which should be quite cool and clean, or by one of the mechanical workers upon the market. The operation in any case consists in pressing the B. in as many different directions as possible, at the same time continually changing the relative positions of the different parts of the bulk. B., when ready for sale, contains on the average 84.91 per cent of fat, 13.05 per cent of water, 1.02 per cent of curd, and 1.02 per cent of salt. The fat consists of a mixture of glycerides, the glycerol base being united with oleic, palmitic, myristic, lauric, butyric, caproic, capric, steric, and caprylic acids in proportions roughly indicated by the order of the names. B. may be adulterated by the addition of other animal fats, and by the introduction of preservatives, as borax, formalin, etc. There are many methods of detecting B. adulteration, one of the most reliable being the determination of the refractive index of a layer of B. by a Zeiss refractometer. World production of B. was estimated in 1938 to be about 3,300,000 tons. Imports into Great Britain and N. Ireland

for the same year were 9,416,366 cwt., an increase of 45 per cent in ten years. Home production, however, remained much the same, namely 892,850 cwt. The chief importing countries were New Zealand, 2,950,000 cwt.; Australia, 1,491,000 cwt.; Eire, 320,000 cwt.; Denmark, 2,254,000 cwt.; Netherlands, 718,600 cwt. Imports from the empire were duty free; those from foreign countries paid 15s. per cwt. The great increase in imports enhanced the difficulties of the home producers, but no agreements for regulation were made, though in 1932 Australia instituted a scheme for voluntary restriction of imports. The value of imports was nearly £50,000,000 annually. Restriction was, of course, unnecessary when the Second World War broke out, and B. was rationed. At the end of 1945 imports were only 3,750,000 cwt.; at the end of 1946, 4,338,000 cwt. The value of imports in 1945 was £31,000,000, in 1946 £38,000,000, and in 1947 £40,000,000. See also CHEESE; CREAMERY; DAIRIES; DAIRY FARMING; FAT; MARGARINE.

Butter, in chem., any substance having the consistency of B. The term is now antiquated. Examples are *butter of antimony*, antimony trichloride; *butter of tin*, stannic chloride; *butter of zinc*, zinc chloride.

Butter-bur, or *Petasites vulgaris*, is a species of Compositae often found in damp fields. The plant is dicocious, and only the male florets yield nectar. There are about thirty florets in the male inflorescence, and five times as many in the female. The leaves are large, about the size and shape of rhubarb.

Buttercup, see RANUNCULUS.

Butterfield, William (1814-1900), Eng. architect, b. in London. Educated at Worcester. Most of his buildings are in the Gothic style. He held quite original views as to colour in architecture, his view being that any combination of natural colours of the materials was permissible. His first important building was St. Augustine's, Canterbury. His reputation was made by 'All Saints', Margaret Street, London, and he also built St. Alban's, Holborn, Keble College, Oxford, the chapel of Balliol College (in modern Gothic), and the new parts of Merton. He executed many restorations.

Butterfish, name given to various kinds of fish on account of their slippery nature: *Coriodax nullax*, a species of Labridae or wrasse, known in New Zealand as kelp-fish or B.; *Centronotus gunnelius*, a species of blenny-fish, known in Britain as the gunnel or rock-fish; and *Poronotus triacanthus*, or dollar-fish, found on the W. coast of the U.S.A.

Butterfly is the name given to the Lepidoptera which are included in the series Rhopalocera, the order being completed by the other series, Heterocera, or moths. There is no definite div. between moths and Bs., but they are generally distinguished from one another by their wings and antennae. All the Rhopalocera have clubbed antennae and no frenulum, a coupling apparatus which projects from the hind wing and unites it with the fore

wing, while the Heterocera have antennae of various shapes, and when clubbed a frenulum is present; the former also are day-flying insects, while the latter are usually nocturnal in habit. Nearly all Bs. remain with their wings in an upright position when at rest, so that only the under surface is seen, but moths keep their wings expanded during repose. The species of Rhopalocera are nearly altogether vegetarian, living on nectar, but a few feed on animal matter, such as decayed fish, and the larvae of others prey on vegetarian insects. In coloration Bs. may be dingy white or yellow, or may be any brilliant colour, such as red, orange, blue, purple, and it is noteworthy that the males are usually brighter than the females; mimicry in colouring is frequently observed in different species, which resemble leaves in their greenness or bark in their brownness, and thus save themselves from being victimised by birds. The colours are caused partly by pigments, but partly also by interference phenomena on the scales, like those to be seen on a soap bubble. The distribution of Bs. is world-wide, but though they are found in almost the very coldest regions, they occur in greatest abundance in warm climates. In Britain there are about seventy native species, and the total number described throughout the world amounts to sev. thousands. In structure Bs. greatly resemble many other insects, but they are noted for the slenderness of their body, the length of their proboscis, their hairy legs, large eyes, and the breadth of their scale-covered wings. The mouth is a sucking organ, mandibles are rudimentary or absent, and the proboscis is formed by the maxillae, and in some species is ten inches long. The legs are always weak, merely supplying supports during rest, and in some cases the front pair is rudimentary. The metamorphosis of the insect is complete, but the life of the adult is usually very short, and seldom survives a single season, though sev. Brit. species, including the peacock and the small tortoiseshell, are able to hibernate in the adult form. In classification the Rhopalocera are divided into six families. The Nymphalidae is the largest of these, and none of the species included in it are capable of walking on the front legs owing to their reduced state. To it belong seven sub-families, and these include such well-known Bs. as the grayling, Scotch argus, dead-leaf, fritillaries, admirals, purple emperor, and the genus *Vanessa*. The family Erycinidae has two sub-families, and in Britain is represented by the Duke of Burgundy fritillary. The 'Blues' are small and slender Bs. comprised in the Lycaenidae, the species of which are usually blue on the upper surface, but many are also copper, white, and yellow. The Pieridae is a family which has sev. Brit. genera, and among the best-known members are brimstones, orange-tips, clouded yellows, and garden whites or cabbage butterflies (q.v.). The difference in form and colour of the sexes in Papilionidae has led to a good deal of confusion among entomologists; the

family has many members of S. America, and some of these are the most beautiful butterflies in existence. The Hesperidae, or skipper family, is characterised by having perfect legs; like the Papilionidae it is world-wide in distribution, but unlike that family its species have largish bodies of very dull colour, many have a jerky flight, but some are extremely rapid when on the wing. In habit they resemble moths, and many of them fly at twilight. Extensive migrations of Bs. belonging to many species are known to take place. The large cabbage white (*Pieris brassicae*) and the small white (*P. rapae*), for instance, have been observed over the



BRITISH BUTTERFLIES

A, cabbage white; B, pale clouded yellow;
C, red admiral; D swallow-tail.

Channel and reaching the S. coasts of England from the European mainland, sometimes in such numbers as to resemble a huge cloud obscuring the sun. See also CABBAGE BUTTERFLY; CATERPILLAR; CHRYSALIS; COCOON MOTHS. See F. W. Frohawk, *Natural History of British Butterflies*, 1924, and *The Complete Book of British Butterflies*, 1934; C. B. Williams, *The Migration of Butterflies*, 1930; E. Sanders, *A Butterfly Book for the Pocket*, 1939; R. South, *The Butterflies of the British Isles*, 1941; E. B. Ford, *Butterflies*, 1945 (where the literature is more fully quoted); Vere Temple, *Butterflies and Moths in Britain*, 1948.

Butterfly Flower, see SCIZANTHUS.

Butterfly Orchis, or *Habenaria bifolia*, and *H. chlorantha*, are beautiful species of Orchidaceae; they are found in Britain. The purple B. O. and white B. O. are *H. papilionacea* and *H. nivea* respectively.

Butterfly Weed, or **Pleurisy Root**, is the *Asclepias tuberosa*, a herbaceous plant of the family Asclepiadaceæ. It is a native of the U.S.A., and was formerly used in cases of pulmonary affections and rheumatism.

Butterine, food product prepared by mixing purified animal fats with genuine butter. By the Margarine Act of 1887 all such substances are to be termed *margarine* (q.v.), and must be so labelled.

Buttermere, Cumberland, England, once with Crummock Water formed one lake. The lake is 1½ m. in length by ¼ m. in breadth, and drains N.W. It is 7½ m. S.W. of Keswick, and is surrounded by superb scenery.

Buttermilk, the fluid residue after butter has been taken from cream. It is generally given to pigs as food, but makes an easily digested and nourishing drink. Some inferior kinds of cheese contain B.

Butternut is the name given to the fruit of the various species of *Caryocar*. It is a large drupe containing four seeds, and comes from tropical America. The term is also applied to the *Juglans cinerea*, the white walnut of N. America, the seeds of which are rich in oil.

Butters, Vegetable, substances having the consistency of butter, being vegetable fatty oils which are nearly solid at ordinary temps. Examples are cocoa butter, butter of almonds.

Butter-tree, or *Pentadesma butyracea*, is the single species of its genus in the family Guttiferæ, found in W. Africa. It yields a fatty substance, which is used as tallow and as a substitute for butter. *Bassia butyracea*, a species of Sapotaceæ, is the Indian B., from the seeds of which a fatty juice is obtained and used in soap-making.

Butterwort is the name applied to sev. species of *Pinguicula*, a genus of Lentibulariaceæ. Three of these plants grow in damp places in Britain, and are noted for their carnivorous habits. The rhizome has a rosette of greenish-yellow leaves which grow close to the ground and are covered with numerous small hairs secreting a sticky fluid. Insects adhere to the leaves, and the acid secreted by the hairs decomposes the bodies and gives the plants the nitrogen they require. *P. vulgaris*, *P. alpina*, *P. lusitanica*, and *P. grandiflora* are the species which are found in Britain.

Butterworth, George Sainton Kaye (1885-1916), Eng. composer, b. in London; killed at Pozieres in Somme battle, Aug. 5, 1916. His first serious composition was *Barcarolle*, orchestral piece, written while still at Eton. Studied music at Royal College of Music and also privately. Took a leading part in the folk-song and dance movement. His *Shropshire Lad*, a tone poem, raised high hopes which were frustrated by the war. His songs are regarded as amongst the finest of the twentieth-century composers. Compositions include *Two Folk-song Idylls* (1912); *The Banks of Green Willow* (1913); *Love Blows as the Wind Blows* (cycle of four songs) (1912); *Folk-songs from Sussex*; *Country Dance Tunes* (1906-

1916); *The Morris Book* (1907-13); *We get up in the Morn*, a part song.

Buttevant, mrkt. tn. in Elre, co. Cork, 6½ m. N.W. Mallow, on the G.S. and W. railway. It has the remains of an abbey. Pop. 2000.

Butt-joint, joint (often in ironwork) in which the edges or ends of the pieces united come squarely together without overlapping.

Buttmann, Philipp Karl (1764-1829), Ger. philologist, b. at Frankfurt-on-the-Main. At the univ. of Göttingen he studied under Heyne. Admitted in 1806 to the academy of sciences, he became, five years later, secretary of the 'historico-philological dept. For some years he had ed. *Spenser's Journal*, but his fame rests on the encouragement he gave to the study of the Gk. language by his *Griechische Grammatik* (1792) (of which the 22nd ed. appeared in 1869), and his *Lexilogus* (1818-25), which is a scholarly discussion of certain difficult words in Homer and Hesiod. Both these works have been trans. into Eng., the translation of the latter having already passed through five eds.

Buttneriaceæ is a term which was formerly used for a group of dicotyledonous plants now included in the family Sterculiaceæ. *Buttneria* and *Theobroma* were two chief genera.

Buttler, Walter, see BUTLER.

Button, Sir Thomas (d. 1634), entered the navy in 1589, but did not rise to renown until in 1612 he was given the command of an expedition whose objective was the search for the N.W. passage. Accompanied by the pinnace *Discovery*, and himself captain of the *Resolution*, he explored the coasts, especially the W. coast, of Hudson Bay for the first time, and proved conclusively that the hoped-for passage did not exist. It was he who named the Nelson R., New Wales, and Button's Bay. Deficiency in equipment caused a high mortality among the crew. Later B. was admiral of the king's ships off Ireland, and did yeoman's service in suppressing piracy. Various disputes with the Admiralty, in which he was supported by the duke of Buckingham, embittered his closing years.

Buttons (Fr. *bouton*, from same root as Fr. *bouter*, to push). The hist. of button-making dates back to Elizabeth's reign. At first B. were only made for purposes of ornamentation. Bright, gaudy, and costly B. with numerous facets were worn in the last century, and similar B. have recently been made in Paris. Birmingham is the centre of the industry in Great Britain. The latter part of the eighteenth century and the early part of the nineteenth century have been called the 'Augustan age' of button-making in Birmingham, when it was the fashion to wear coats covered with gilt B. At the beginning of the nineteenth century B. Sanders, a Dane, introduced the cloth-covered button, in 1807, and his son in 1823 introduced the use of a canvas tuft instead of the metal shank. The mechanical manuf. of covered B. was first started in the U.S.A. in 1827 by Samuel Williston. B. are made of various

materials. B. of vegetable ivory or 'Corozo Nuts' (see IVORY), are largely used now. It is softer than true ivory and easily turned and dyed. Brass B. were first made at Birmingham in 1689. Ivory B. are among the oldest of all. Horn B. were made at Birmingham in 1777. Towards the middle of the nineteenth century Émile Bassot invented a widely used process for making them from cattle hoofs softened by boiling. Pearl B. are made from pearl oyster shells. Glass B. are especially made in Bohemia, and porcelain B. were first made in 1840 by an Englishman, R. Prosser. Bs. are now widely manufactured in plastic.

Buttress (O.F. *bouterez*, from *bouter*, to thrust) projection from a wall provided to give additional strength to the same. In classical architecture there were no visible Bs., their places being taken by pilasters, antæ, etc. The Bs. of the early Romanesque style frequently presented the form of a pillar. Bs. of Early Eng. style have a considerable projection with two or three set-offs sloped at an acute angle dividing the stages and crowned by triangular heads.

Buturlinovka, tn., with mills and tanneries, in the Voronezh region of the R.S.F.S.R., 85 m. S.E. of Voronezh; pop. 23,000.

Butyl Alcohol, one of the isomeric alcohols of the general formula $C_4H_{10}O$. There are two primary, one secondary, and one tertiary forms. Normal B. A., $CH_3(CH_2)_3OH$, is a colourless liquid prepared by reducing normal butyl aldehyde with hydrogen and reduced nickel. Isobutyl alcohol, $(CH_3)_2CH-CH_2OH$, is a disagreeably smelling liquid occurring in fusel oil. The secondary alcohol, methyl ethyl carbinol, $CH_3(C_2H_5)CHOH$, is a strongly smelling liquid boiling at 99° C. The tertiary alcohol, trimethyl carbinol, $(CH_3)_3COH$, is a crystalline solid prepared by the action of zinc methyl on acetyl chloride.

Butyl Chloral, $CH_3-CHCl.CCl_2CHO$, an oily liquid prepared by the action of chlorine on acetaldehyde. It readily unites with water to form B. C. hydrate, $C_4H_9Cl_3O \cdot H_2O$, a crystalline solid used in medicine as an analgesic. It has similar properties to chloral hydrate, in the manuf. of which it occurs as a by-product.

Butyric Acid, $CH_3-CH_2-CH_2CO_2H$, volatile fatty acid occurring in butter fat, in parsnip and other vegetable oils, and in the perspiration of animals. It is an oily colourless liquid with an unpleasant smell, solidifies at -19° C., boils at 162.3°, and has a sp. gr. of 0.974. It is miscible with water and alcohol, and forms salts and esters called butyrates. It may be prepared by adding putrid cheese to sugar or starch mixed with water, the cheese introducing the bacillus by whose agency the acid is formed. Chalk is usually added to bring off the acid in the form of the calcium salt.

Isobutyric Acid, $(CH_3)_2CH-CO_2H$, isomeric form found in some vegetable oils. It has an unpleasant smell, boils at 155° C., and has a sp. gr. of 0.969.

Butyric Ester, or Ethyl Butyrate, liquid obtained by distilling butyric acid, alcohol, and sulphuric acid. Unlike butyric acid it has a pleasant smell resembling that of pineapple. It is commercially known as pineapple oil, and is much used as a flavouring agent for sweets, etc.

Butzer, Martin, see BUCKER.

Butyrin, $C_4H_9(C_2H_5O)_2$, yellowish liquid with a bitter taste which forms about 3.8 per cent of butter fat. It is the glyceryl ester of butyric acid.

Butzow, tn. in Mecklenburg, Germany, 18 m. S.W. of Rostock, with which it is connected by rail; pop. 6000.

Buxa, or **Baxa**, name of a tn. and pargana (or dist.) in Jalpaiguri div. of E. Bengal and Assam, on borders of Bhutan, India.

Buxar, see BAXAR.

Buxbaumia, *Buxbaumia* or *B. aphylla*, is a moss of the order, Bryineæ and family Buxbaumiaceæ. It was named in honour of Buxbaum, the Ger. botanist, and is a rare plant occasionally found in Britain.

Buxina, alkaloid occurring in the common box-tree (*Buxus sempervirens*).

Buxtehude, **Dietrich** (1637-1707), Swedish composer and organist, b. at Helsingborg; organist of the Marienkirche, Lubeck, from 1668. As organ composer and player he had a great influence on J. S. Bach, who made a 200 m. journey on foot to hear him play. He composed many works for the organ, trio sonatas for violin, gamba, and continuo, and a number of church cantatas. *D.* at Lubeck. See life by A. Pirro and W. Stahl, *Franz Tunder und Dietrich Buxtehude*, 1926.

Buxton, watering-place and mrkt. tn. in Derbyshire, 36 m. N.W. of Derby, and 163 N.W. of London by rail, pop. 15,641. It is the highest tn. in England, 1000 ft. above sea level, is the centre of the Peak dist., and is remarkable for its very bracing climate. It has long been famous for its mineral waters, which were known to the Romans. The springs supply hot and cold water, though only a short distance apart; the hot springs have an even temp. of 82° F. The baths are the property of the duke of Devonshire. At the Devonshire Hospital over 3000 gouty and rheumatic patients are treated annually. There are excellent hotels, hydropathics, and the various estab. that are to be found in a favourite watering-place. In the vicinity is Diamond Hill, so named from its abundance of quartz crystals; also Poole's Hole, a remarkable stalactite cavern.

Buxton, Jedediah (1707-72), calculator, could work out the most elaborate problems in number, although he never mastered any arithmetical rules. By striding over the estate of Elinton, he gave its area accurately in ac., roods, etc., and even sq. in. At a performance of *Richard III.*, his one amusement was to count the words Garrick uttered. Another time he expressed in pounds, after mental reckoning only, the product of a farthing doubled 139 times. His result of thirty-nine figures is correct, as verified by logarithms.

Buxton, Sydney Charles, first Earl, of Newtimber, Sussex (1853-1934), Liberal statesman and author, son of Charles B., M.P., and Emily, daughter of Sir Henry Holland, Bart. He was educated at Clifton and Trinity College, Cambridge. His first attempt to enter Parliament was in 1880, when he contested Boston unsuccessfully. He became M.P. for Peterborough three years later, but failed to secure re-election in 1885. Next year he became M.P. for the Tower Hamlets (Poplar div.), and continued to hold the seat through successive elections. He was a member of the Royal Commission on Education, 1886-89, and a member of the Income Tax Committee in 1904. From 1892 till 1895 he was under-secretary for the colonies. From 1905 to 1910 he was postmaster-general, and in that capacity instituted the penny post to the U.S.A. 1908, and the Canadian magazine post 1907, and acquired the first wireless telegraph station for the post office 1909. In 1910 he became president of the Board of Trade, and was the author of the 'Fair Wages' resolution of the House of Commons: a resolution requiring a clause to be inserted in all gov. contracts to secure better payment for workers engaged in such work. Responsible for Copyright Act, 1911; Unemployed Section (Part II.) of the National Insurance Act, 1912; Pilotage Act, 1912. In 1914 he was made a viscount, and he was high commissioner and governor-general of S. Africa 1914-20. He received his earldom in 1920. He pub. *Finance and Politics* (1883-85); *Political Manual* (1886); *Handbook to the Death Duties* (1893); *Mr. Gladstone as Chancellor of the Exchequer* (1901); *Fishing and Shooting* (1902); *The Fiscal Question: Handbook of Political Questions* (1904); *General Rothera* (1924).

Buxton, Sir Thomas Fowell (1789-1845), Eng. philanthropist, b. at Earl's Colne, Essex, was a brilliant student at Trinity College, Dublin, in spite of his very meagre groundings in academic work. In 1808 he entered Messrs. Truman & Hanbury's brewery. So wholehearted was his devotion to business that he became partner in 1811. His wife, Harriet Gurney, was a sister of the famous Mrs. Fry. People first recognised his talent as a speaker and his disinterested enthusiasm in his speech for the Spitalfields weavers, 1816. From 1818 to 1837 he represented Weymouth in Parliament, his sturdy opposition to bribery being responsible for the loss of his seat. Though he sacrificed many hours to the question of prison reform, and tried to carry a scheme for bettering the condition of the African Negroes, his life work was to promote emancipation of slaves throughout Brit. dominions. In this cause his activities were never relaxed, and he proved himself a worthy successor to Wilberforce as leader of the anti-slavery party, 1824. See R. H. Mottram, *Buxton the Liberator*, 1946.

Buxtorf, Johann (1584-1629), Ger. Heb. scholar, became prof. of Heb. at Basle in 1591. In his devotion to rabbinical literature he has hardly been surpassed. His

reputation depends chiefly on his *Lexicon Chaldaicum, Talmudicum, et Rabbinicum* and his *Concordantiae Bibliorum Hebraeorum*, both of which were pub. by his son, but his greatest work perhaps was his folio Heb. Bible, to which were added the Aramaic paraphrases, or Targums, and the commentaries of Ben Ezra, Rashi, and other rabbins, 1618. A fatal attack of the plague cut him off in the midst of his studies.

Buxtorf, Johann (1599-1664), son of the former, also occupied the chair for Heb. at Basle. Much of his public life was absorbed in an embittered and learned argument with a Frenchman, Louis Capel. B. maintained that the Massoretic text alone was the 'Hebrew Verity,' and that the vowel points and accents, as well as the letters, were possessed of divine authority, and were at least as old as the days of Ezra. Capel proved fairly conclusively that the vowels, etc., go back only to the fifth century A.D.

Buxus, genus of dicotyledonous plants of the order Buxaceae, of which the common name is box (q.v.).

Buxwiller, see BOUXWILLER.

Buys-Ballot, Christoph (1817-90), Dutch meteorologist, b. at Kloetgen in Zeeland; studied at Utrecht, where he became prof. of mathematics, 1847, and of experimental physics, 1870, and in 1854 director of the Royal Meteorological Institute. He invented the aeroklinoscope and a system of weather signals which were a great aid to international uniformity in meteorological observations. His observations have been formulated in a general law of storms which may be put thus for the N. hemisphere, 'Stand with your back to the wind; the low-pressure area will be on your left hand. For the S. hemisphere the reverse will obtain.' This is known as B.'s law. His works include *Changements périodiques de la température* (Utrecht, 1847); and in Eng., *Suggestions on a Uniform System of Meteorological Observations* (1872-73).

Buyukdereh, vil. beautifully situated on the Bosphorus, about 10 m. from Istanbul. It is a favourite summer resort of Europeans.

Buzançais, tn. with textile industry in the dept. of Indre, France, on the R. Indre, 13 m. N.W. of Châteauroux. Pop. 4000.

Buzancy, tn. in France, 20 m. S. of Sedan. In the First World War it was the first objective of the Amer. Army under Gen. Pershing in the offensive against the Gers. In the autumn of 1918 to secure Mezires. Notwithstanding the skillful ruses employed by the Amers. to deceive the Gers., which they did to a great extent, little progress was made. The attack was renewed early in Oct. and B. was taken on Oct. 11.

Buzău, cap. of prov. of B. in Rumania, 42 m. N.E. of Ploesti; the seat of a bishop, and a market for grain, timber, and petroleum; pop. 30,000.

Buzuluk, tn. with tanneries, copper foundries, etc., in the Chkalov region of the R.S.F.S.R., 110 m. S.E. of Kubishev (Samara), near junction of R. Samara and R. B. Pop. 20,000.

Buzzard is the name given to sev. genera of birds of prey of the falcon family, Falconidae, to which belong also the kites. The species usually live on such small animals as mice, but they are known to carry off domestic fowls. They are cosmopolitan but for Australia. *Buteo vulgaris*, the brown or common B., and *Buteo lagopus*, the rough-legged B., are the only natives of Britain. *B. lineatus*, the red-shouldered hawk, and *B. borealis*, red-tailed hawk, occur in N. America. *Pernis ptilorvus*, the honey B., belongs to a different sub-family from *Buteo*, while *Cartharus aura*, the turkey B., is an Amer. vulture.

Buzzard Clock, see DOR-BEETLE.

Buzzard's Bay is a large inlet of the Atlantic Ocean on the S.E. coast of Massachusetts, U.S.A. New Bedford, the cap. of Bristol co., stands on the estuary at the mouth of Acushnet R., which falls, with other small streams, into this bay. Between B. B. and Plymouth is the largest stretch of untamed soil in the state.

Buzzer, device somewhat resembling the ordinary electric trembler bell with the gong removed. It is used to produce the intermittent excitation of an oscillatory circuit at its own natural frequency. If the circuit has been calibrated in frequency or wavelength, the attachment of a B. transforms it into a B. wave-meter, which is a convenient source of oscillations for calibrating the tuning circuits of a wireless receiver.

By, John (1781-1836), engineer and founder of Brltown, now Ottawa. He was a lieutenant-colonel in the Royal Engineers, and served in the Peninsular war. He constructed the Rideau Canal, 1827-32, in Canada, joining the Great Lakes with the St. Lawrence. The cost of over a million pounds came in for much criticism in the Brit. Parliament.

Byblos, or **Bylus**, anc. city of Phoenicia, the traditional bp. of Adonis. See JEBEL, or JERBEL.

Bydgoszcz, see BROMBERG.

Byfleet, par. and vil. in N.W. Surrey, 22 m. from London. Pop. 4800.

Bygdea, tn. of Sweden in the prov. of Vesterbotten, on W. shore of gulf of Bothnia.

Byker, township in the bor. of Newcastle-on-Tyne (q.v.).

Byland Abbey, Cistercian abbey in Yorkshire, 6 m. from Easingwold. Founded 1177. The ruins were given to the nation in 1920 by Lady Julia Wombwell.

By-law, or **Bye-law**, is a private regulation generally made by councils, corporations, and companies for the control of order and fair gov. within some jurisdiction. Bs. are binding, unless contrary to the laws of the land, or to the act of any corporation, or unless they are obviously unreasonable. The power of Bs. extends to taxing, licensing, and the regulation of amusements. Fines and forfeitures may also be enforced by Bs. Corporate bodies also are empowered by their charters to make Bs. which are binding on their members. Every corporation can of necessity repeal or alter

any B. made by itself. By various statutes powers are given to bor., co., and dist. councils to make Bs. for the gov. of the said dists. Such Bs. are not enforced until after the expiration of forty days, or till a copy has been sent to a secretary of state, who has power to disallow or alter the Bs. Bs. must generally be submitted to some confirming authority for sanction and approval. For example, the Board of Trade regulates traffic on railways and tramways, the Board of Education makes Bs. compelling attendance at school, the Ministry of Health regulates, by means of Bs., the use of public baths and washhouses, lodging-houses, and slaughter-houses. Local authorities are apt to encroach on the powers of the central depts. of state by arbitrary use of Bs., but this tendency can be checked to a certain extent by the confirming authority of the appropriate gov. dept., e.g. the Bs. of co. councils must obtain the assent of the Ministry of Health, and those of a bor. corporation may be opposed by the Privy Council, while the courts also have power to pronounce on the reasonableness or otherwise of Bs. Bs. may also be made by societies, guilds, and companies.

Bylina (The Past), name given to epilo songs of Russian popular poetry. Their heroes (*bogatyri*, or paladins) are mythical or historical persons, or types of the forces of nature. The mythical, or 'elder paladins', have but a small part assigned to them, the bulk dealing with the 'younger paladins' (historical figures such as St. Vladimir, Boris Godunov, Ivan the Terrible). These ballads have been collected from bards in N. Russia and Siberia, especially in the Olonetz, Archangel, and Tomsk dists. Like all poems dating from very early times, they were first handed down orally. Richard James, chaplain of the Eng. embassy in Russia (c. 1619), collected some of them, but interest was keenly aroused only in the nineteenth century. The poems are divided into sev. cycles: cycle of Kiev (chief figures Vladimir, Ilya Muromets); cycles of Novgorod, Moscow, Peter the Great, and others. Chief collections: Ribnikov, 1860-71; Kirelskii, 1868-74; Sobolevskii, 1895-1900; Avenarius's *Anthology*, 1885. Consult Ralston, *Songs of the Russian People*, 1872, and *Russian Folk-Tales*, 1873; Rambaud, *La Russie épique*, 1876; Wöllner, *Untersuchungen über die Volksepik der Grossrussen*, 1879; Wesselsky, *Beiträge zur Erklärung des russischen Heldenepos* (*Archiv für slavische Philologie*, vol. III., 1879); *Épique Songs of Russia*, trans. by Hapgood, 1886.

Byng, George, Viscount Torrington (1663-1733), Brit. admiral, b. at Wrotham, Kent; went to sea at fifteen; was made captain by the prince of Orange in 1688, and in 1703 became rear-admiral of the Red. In 1704 he served under Sir Cloudesley Shovell, and distinguished himself at Gibraltar, and was knighted by Queen Anne for gallantry at Malaga. He was elected to Parliament in 1708, and represented Plymouth till 1721. In 1708 he was made admiral of the Blue and

defeated the Fr. fleet of the Pretender; in 1715 served against the Fr. in the Downs and was made a baronet; in 1718 dispersed the Sp. fleet off Messina, and was appointed treasurer of the navy and rear-admiral of Great Britain. In 1721 he became a Privy Councillor, Baron Southhill and Viscount Torrington; in 1725 a Knight of the Bath, and in 1727 First Lord of the Admiralty.

Byng, John (1704-57), son of Lord Torrington, and a Brit. admiral. His father, who was most influential in naval matters, used his influence to further the interests of his son. The result was that B. received rapid and not altogether merited promotion. He entered the navy in 1718, became a captain in 1727, a rear-admiral in 1745, a vice-admiral in 1747, and an admiral in 1755. He was never given dangerous employment, but was always chosen for the more comfortable work in the navy. In 1756 he sailed from Gibraltar to relieve a garrison that was besieged in St. Philip in Minorca. When he sailed he was a man with a grievance, and he notified the ministry that he would not attempt to relieve the garrison in the face of any difficulties. He fought an ineffective naval battle with the Fr., hung round Minorca for a few days, and then returned without having done anything. The fort surrendered, and B. was brought home, tried by court-martial, and executed for not having done his utmost. As Voltaire remarked, he was shot *pour encourager les autres*.

Byng of Vimy, Julian Hedworth George, first Viscount (1862-1935), Brit. soldier. Seventh son of the second earl of Strathford. Governor-general of Canada 1921-26. Began army life as a subaltern in the 10th Hussars, 1883, reaching the rank of Lieutenant-general, 1916, and full general, 1917. He served in the Sudan expedition, 1884, including El. Teb and Tamai; in S. African war, 1899-1902, being mentioned in dispatches. Commanded 1st Cavalry Brigade, 1907-9, and the E. Anglian Div. in 1910-12, and, from 1912 to the outbreak of the First World War, he was general officer commanding in Egypt. In the First World War he commanded the 3rd Cavalry Div. of the Brit. expeditionary force till May 1915; the 9th Army Corps Mediterranean expeditionary force, 1915-16; the 17th Army Corps during 1916; the Canadian Army Corps in France, from May 1916 to June 1917, and finally the Third Army in France, from June 1917 to the end of the war. At the conclusion of the war he received the thanks of Parliament for his services and a grant of £30,000 and was by letters patent dated Oct. 7, 1919, created Baron B. of Vimy of Thorpe-le-Soken. Held many foreign decorations. In the First World War his outstanding successes were the capture of Vimy Ridge on April 9, 1917, by his Canadian troops; the execution of a brilliant piece of work in Nov. 1917 near Cambrai; and his resistance to the Gers. in their spring attack of 1918. Later, when the allied armies began the final advance to victory, his army broke the Hindenburg line (q.v.).

For the greater part of the war he commanded the Canadian Corps, and was made governor-general of Canada in 1921. Commissioner of the Metropolitan Police in 1928-32.

Bynkershoek, Cornelius van (1673-1743), Dutch jurist, b. at Middelburg, Zeeland; studied at the univ. of Franeker, and took a doctor's degree in 1694, settling down to an advocate's practice at The Hague. In 1703 he became a member of the Supreme Council of Holland, Zeeland, and W. Friesland, and in 1742 became its president. Author of numerous works on international law.

By-pass Condenser, electrical condenser used to separate alternating currents (a.c.) of any frequency from direct currents.

By-pass Valve (engineering), valve by which the flow of a fluid in a system is carried past some particular plant in operation. It is fitted in a pipe connecting the pipes leading to and from the plant and is normally closed. Where a fluid is passed through a number of filters, a B. V. is usually provided at each filter, so that any filter may be opened up for cleaning without interfering with the flow in the system.

By-products, goods of commercial value which occur in the manuf. or preparation for the market of some other commodity which is looked upon as the main product. B. have always been considered in the economic adjustment of agric. and pastoral enterprises, but it is only within recent years that their great importance in various forms of manufs. has been recognised. B. not only mean additional profit in the ordinary course of a particular business, but they also represent a means of insurance, or of levelling up the various risks; for it often happens that the markets supplied by the different products are independent, so that the dangers of a movement disastrously affecting the value of one product may be counteracted, or at any rate mitigated, by a profitable treatment of another. It may thus happen that what was considered the main product at the beginning of an enterprise may become secondary, and a former by-product may become the prin. article dealt with. Where B. have gained enhanced importance in this way it is more convenient to speak of all the marketable goods as joint products. At the present time, when chemical science enables us to treat profitably what were formerly called waste products, and when businesses design to keep many stages in the production of an article under one control, the treatment of B. makes the question of estimating costs and values an important one. The matter is fairly simple when the various products occur in a fixed and invariable ratio of quantity and quality, because the total income will be the sum of the amounts realised by each of the joint products, and an increased outlay should bring profits in roughly the same proportion. It occurs much more often, however, that certain products may be developed at the expense of others, either as regards quantity or quality

A farmer, for instance, may rear sheep principally for meat or principally for wool, but also with a view to profitting by both. His methods will vary according to which he regards as the main product, and it may be a matter of somewhat nice adjustment to arrive at the more profitable of the two courses. The farmer would no doubt decide from experience, and might even experiment with different breeds and in different seasons. The case of the big manufacturing concern is often much more complex. Where the B. are numerous and valuable, it may be that the correct adjustment of the proportions of the cost allotted to the various products may make the difference between success and failure. That is to say, the particular advantage which enables a business to operate as a profit-making concern, and to keep its place among its competitors, may be the development of a by-product in a particular way. Sometimes the retention or disposal of a waste product is more expensive than its conversion into something marketable, or may constitute such a nuisance that the legislature insists upon a new method of disposal. An instance of the latter is supplied in the Leblanc process of alkali manuf.: the hydrochloric acid generated was formerly allowed to escape into the atmosphere with some danger to public health, and the manufacturers were consequently compelled to dissolve it in water in the acid towers. An interesting feature of the compulsory change was that the old Leblanc process could compete with more modern processes only in virtue of the profit gained by the sale of what was formerly a noxious waste product. However, as a process for the manuf. of soda, the Leblanc process has now been superseded by the ammonia-soda process.

Some Important By-products.—In the alkali process already referred to, another former waste product, 'alkali waste,' composed mainly of calcium sulphide, was treated for the recovery of the sulphur. In most chemical works an effort is made to utilise or render marketable all the products of the chemical action; the pyrites burnt in sulphuric acid manuf. is treated to recover the copper and iron. Soap works produce glycerine, which is often purified for sale by the soap manufacturers themselves. Brewing yields an excess of yeast which is sold to bakers and others, and the spent malt is prepared as a cattle food. In the great canning industries of the U.S.A. all the animal products, hide, hair, bones, horns, hoofs, are dealt with as near the factory as possible. Molasses and syrup are B. of the sugar industry. The oil-cake produced from the pressed seeds in linseed-oil factories is used as a cattle food. In saw-works the most notable of all illustrations of the utilisation of B. occurs. Not only is the coke sold for fuel, but the liquid or coal tar produced during the dry distillation of coal yields a variety of useful products. When subjected to fractional distillation, benzene derivatives are separated which are the basis of many different dyes, drugs used medicinally, flavouring agents,

and volatile benzols which are used as solvents and motor fuels. The ammoniacal liquor is worked up into ammonium sulphate for use as a fertiliser and formerly represented a considerable revenue. Its value as a by-product has practically disappeared owing to the extensive production of synthetic ammonia by nitrogen fixation processes. Thus, some apparently waste products become valuable B., while others, once valuable, become of little account. One example may be given: as mentioned above, in the early days of the Leblanc process, it was helped considerably by the value of the by-product hydrochloric acid, while in the early days of the electrolytic process for soda compounds chlorine was a great nuisance. To-day the situation is reversed.

Byrd, Richard Evelyn, Amer. explorer, b. at Winchester, Virginia, Oct. 25, 1888; second son of Richard Evelyn B., lawyer, member of an old Virginian family. It appears that when he was twelve he visited the Philippines, and there learned to rough it. He was educated at Shenandoah Valley Military Institute, Virginia Military Academy, and Univ. of Virginia. As a result of two accidents—one at football, the other in a gymnasium—he became lame in his right leg; yet he graduated at U.S. Naval Academy 1912, and became an ensign in the U.S. Navy. He was employed on suitable duties, rose through various grades to lieutenant-commander, and, on account of his leg, was retired on three-quarter pay, 1916. He began aviation at Pensacola in 1917, and joined the U.S. Air Force manœuvring over Canadian waters. He was in England in 1921, and narrowly missed being in the airship disaster of Aug. 23. He next entered the aviation unit of the MacMillan polar expedition of June to Oct. 1925; and then, in a Fokker three-engine monoplane with 200-h.p. Wright air-cooled motors, accompanied by Floyd Bennett, he flew to the N. Pole and back to his starting place, King's Bay, Spitzbergen, on May 9, 1926—covering 1360 m. in 154 hrs. He was then raised to the rank of commander. He also flew from New York to France in 42 hrs.—June 29 to July 1, 1927. Flew over S. Pole, 1929. Explored Antarctic (q.v.) in 1935. In 1939 he was made commander of U.S. Antarctic service, an expedition by the gov. to the Antarctic. Patron's medal Royal Geographical Society, 1931; congressional and two special congressional medals, and many other awards. (On Dec. 2, 1946, he led a new Antarctic expedition, consisting of thirteen vessels, including the flagship *Mount Olympus*, an ice-breaker, a seaplane tender, and a destroyer. The plan of the expedition was to plot as much as possible of the Antarctic continent and map the interior as far as long-range seaplanes and ice transport could penetrate. Pub. *Little America: Aerial Exploration in the Antarctic* (1931); *Discovery* (1935); *Exploring with Byrd* (1937); *Alone* (1938). See also ANTARCTIC EXPLORATION.

Byrd, or Byrde, William C. (1542-1623) Eng. musical composer, b. probably at

Lincoln and d. probably on his estate at Stondon, Essex, describing himself in his will as being 'in his eightieth year.' According to Anthony Wood B. was 'bred up to music' under Thomas Tallis, a gentleman of the Chapel Royal. About 1563 he was appointed organist of Lincoln Cathedral. In Queen Elizabeth's Chapel Royal he shared the post of organist with Tallis and about 1575 the two composers secured a licence giving them the sole right to print and sell music and in that year they pub. a collection of Lat. motets for five and six voices; but the monopoly would not appear to have been very remunerative. About 1581 B.'s name figures in lists of recusants, and though he remained at the Chapel Royal he was all his life a Catholic. In 1588 he pub. *Psalmes, Sonets, and Songs of Sadnes and Pietie* and in 1589 *Songs of Sundrie Natures*—of which a second ed. was pub. in 1610—and *Liber Primum Sacrarum Cantionum* in two series. B. was the earliest Eng. composer of madrigals and most of them were pub. in his lifetime. Two of them were included in Thomas Watson's *First Set of Italian Madrigalls Englished* in 1590. At about this time he became involved in a long law-suit over the lease of the property of Stondon Place, which had been the estate of one Wm. Shelley from whom it had been sequestered on conviction for treason. B. was upheld in possession by James I., even though it had been confiscated by a recusant and even though B. himself had been excommunicated. In 1607-11 he pub. *Psalmes, Songs and Sonnets: some solemn, others joyfull; Parthenia*, a collection of virginal music (in collaboration with John Bull, a noted keyboard player, and Orlando Gibbons, organist of Westminster Abbey); and two books *Gradualia* in 1607, of which a second ed. was issued in 1610. In addition to the above works B. also composed three masses, for three, four, and five voices, respectively, pub. about 1588. All of them have appeared in modern eds. and enhance B.'s claim to rank as the greatest Eng. composer of his age. He composed sacred music and secular choral music of the highest quality, in some instances reaching the sublime. He was one of the founders of the Eng. madrigal school and was a madrigalist of charm and individuality though opinions differ on whether he was in this respect the equal of Gibbons, Thomas Morley, or John Wilbye. See lives by W. H. Haddow, 1923, and E. H. Fellowes, 1929.

Byrgius, Justus (1552-1633), inventor of various astronomical instruments, was b. at Lichtensteig, canton St. Gall, Switzerland. He served under Wilhelm IV. of Hesse and Emperor Rudolf II. His first work was a celestial globe on which the stars were placed according to his own observations. He also invented a system of logarithms and some proportional compasses, but reliance cannot be placed on these.

Byrlaw is the name given to a sort of popular jurisprudence formerly in use in Scotland, in vils., and among husband-

men. As the B. was formed by common consent of the villagers or neighbours, so it was administered by judges chosen from among and by themselves. These judges were called 'B. men,' a phrase still in use in parts of Scotland to denote a judge or umpire.

Byrne, Donn (Brian Oswald Donn-Byrne) (1889-1928), Irish novelist, b. in New York. He wrote three vols. of short stories and eleven novels, the best of which are about Ireland. He estab. his reputation with *Messer Marco Polo* (1922). B. was killed in a motor accident. There is a biography by Thurston Macaulay, 1930.

Byrnie, ringed shirt of mail (A.-S. *byrne*), reaching first to the knees, later only to the hips, with wide, short sleeves. Worn by ant. Scandinavian warriors.

Byrom, John (1691-1763), poet and stenographer, b. at Manchester. After studying at the Merchant Taylors' School he entered Trinity College, Cambridge. He graduated B.A., and was chosen fellow in 1714. In the same year he contributed to the *Spectator*, as John Shadow, two papers on dreams, and also his first poem, a pastoral entitled *Colin and Phoebe*. He took his M.A. in 1715 and resigned his college preferment in 1716. He went to Montpellier and there began a study of medicine. Soon after his return he married his cousin, Elizabeth B., and under pressure of necessity began to teach an improved system of shorthand in Manchester and afterwards in London. In 1740 he came into possession of the family estate at Kersall, gave up teaching, and employed his time in versifying in genial satire on topics of the day. He was a friend of John Wesley, but in 1729 he became a disciple of Wm. Law, and an ardent high Churchman. His epigram, 'God bless the King, I mean the Faith's Defender' shows that he was a Jacobite in his political sympathies. His remarkable *Diary and Remains* were pub. in 1854-57 by the Chetham Society.

Byron, George Gordon, sixth Baron (1788-1824), son of Capt. John B. of the Guards, grandson of Adm. John B. (q.v.), and great-nephew of the fifth Lord B., who was usually designated the 'wicked lord.' The future poet was descended from a race who had for generations past been noted for the looseness of their living and their lack of morals. Especially were these traits emphasised in the character of the father of the poet. B. was the son of the second marriage of Capt. B., his mother being Catherine Gordon, of Gight in Aberdeenshire, an heiress whose fortune her husband squandered. George Gordon B., so called after his maternal grandfather, was b. in Holles Street, London, on Jan. 22, 1788. His early life was passed in the tn. of Aberdeen, where he also received the first part of his education, and where he imbibed his love for the grandeur of mt. scenery, and also his knowledge of the Scriptures, a knowledge which he tells us he received at the hands of his nurse, May Gray, to whom he was devotedly attached. The future poet, who was b. with a malformation of his feet that

rendered walking distinctly arduous, could not roam about the country as he would have wished, but still seems to have spent a good deal of his time in the open. He was sent for sev. seasons to the neighbourhood of Ballater. In May 1798 his great-uncle d., and B. succeeded to the title and the estates. He and his mother immediately came S. from Aberdeen and took up their residence at Newstead. From this place B. was sent to a preparatory school at Dulwich, and later, in April 1801, he entered Harrow. There he stayed for four years, his greatest contemporary being Sir Robert Peel; his school work



LORD BYRON

showed no signs of brilliance and his reading was desultory, but his strongest point was his declamation. His friendships at school, he tells us, were passions, and altogether he was a very queer kind of boy. He was known throughout the school as the ringleader of any possible mischief, and yet he was at other times serious and thoughtful beyond his years. His lameness prevented his giving full vent to his passion for active games, yet he made a reputation as a swimmer, and he also played cricket. During his schooldays he had his first *grande passion*, the object of it being Mary Chaworth, a distant relative, and his senior in age. His first love, he tells us, was an abiding attachment on his part, and certainly a number of his early poems have his object of adoration as their theme, whilst the subject often occurs in his later poems. In Oct. 1805 he entered Trinity College, Cambridge, but his residence there is simply one long record of high living, though he formed friendships and attachments there which were worthy of his

future greatness. During the year 1806 appeared the first of his juvenile poems. *Hours of Idleness* appeared in 1807, whilst *Poems Original and Translated* appeared in 1808. The adverse criticism which the *Edinburgh Review* gave to his *Hours of Idleness* provoked the pub. In March 1809 of *English Bards and Scotch Reviewers*, which satirised the editor (Jeffrey) and the patron (Lord Holland) of the *Edinburgh Review*, but is chiefly concerned with the bards, both those he admires and those he despises. Coming of age in 1809, he immediately decided to fulfil the project which he had long had in mind of taking a prolonged tour in the E. He had already taken possession of his inheritance, and had also in the March of the year of his coming of age taken his seat in the House of Lords. Now, together with Hobhouse, his closest friend, he set out for a prolonged tour. This tour lasted for about two years. He left England in July 1809, and returned in July 1811. *Childe Harold's Pilgrimage* describes more or less accurately the events of the first year of his travels. He visited Spain and Portugal, from thence he proceeded via Malta to tour Albania and Greece. In the next year he visited Asia Minor and later Constantinople. The second year of travel is not so well known as the first, but during it the first two cantos of the *Childe Harold* were written, as were also the *Hints from Horace* and *The Curse of Minerva*. These poems were pub. on his return to England in July 1811. In the meantime his mother had d., and although he did not entertain whilst she lived a high affection for her, his grief on her death was very real. The pub. of his new poems on his return to England, and his general prominence, for on his return he took an active part in political work in the House of Lords, made him the hero of the town. He could go everywhere, he was received rapturously wherever he went, his fame sprang into existence apparently in a single night—or, as he himself says, he 'awoke one morning and found himself famous.' He was known as a rising statesman too. His output of poetry still continued to be great; in the year 1813 he pub. *The Giaour*, *The Bride of Abydos*, and wrote *The Corsair*, which was pub. at the beginning of the next year. The poems raised him to a still higher level in the ranks of poets, and increased an already great reputation. In 1813 he again met his half-sister, Mrs. Leigh, and if the stories which were currently believed are true, the new influence was not altogether for good; it is in any case well known that he always had a greater affection for his half-sister than for any other person. He was now at the height of his reputation, he was the lion of society, and he had permanently estab. his reputation as a poet. He still continued to write, and in 1814 appeared the stanzas on the abdication of Napoleon, and the sequel to *The Corsair*, *Lara* (Aug. 1814). In the same year he engaged himself to Anne Isabella Milbanke, the heiress to a peerage in her own right, and his marriage to her

took place in the Jan. of the following year. Husband and wife finally settled down in Piccadilly Terrace, London. From his correspondence, the early days of his marriage seem to have been spent quite happily, but there is no doubt that his conduct was often eccentric even to the verge of madness. He wrote but little poetry. *Hebrew Melodies* appeared in April 1815. Almost immediately after the birth of their child, Lady B. fled from her husband's house and claimed the protection of her father, and the couple separated. The exact reason for the separation is unknown. The work *Astoria*, pub. in 1805, attempted to prove the charge of incestuous intercourse with Mrs. Leigh, whilst *Byron, the Last Phase*, 1909, by Robert Edgecombe, defended the poet on that charge. The separation was the talk of London for a considerable time, and B. came rapidly down from his high position. He was now the most unpopular man in town. He fled from social ostracism, and immediately the articles of separation were signed he started on a European tour. He spent the early part of his tour with Shelley, and his poetry pub. at this time shows obviously the influence of Wordsworth, which had affected him through Shelley. Among the poems written in 1816-17 were *Siege of Corinth*, *Parisina*, *Prisoner of Chillon* (and other poems), *Childe Harold's Pilgrimage*, cant. iii., *Monody on the Death of Sheridan*, *Manfred*, and *Lament of Tasso*. From 1816 to 1819 B., who was accompanied by Hobhouse, lived near Venice. His life at Venice was one long deliberate attempt to forget the past in an orgy of profligacy, but during the whole of the time his active mind was at work, and he was continually busy with his poetry. The fourth canto of *Childe Harold* was worked up at this time, and pub. in 1818, and in the Sept. of the same year he started *Don Juan*. The process of his composition and of the publication was slow. Cantos i. and ii. appeared in 1819, iii., iv., and v. in 1821, and cantos vi.-xiv. in the years 1823-24. *Don Juan* was intended to be his great poem with a plan setting forth the ideas, morals, and principles of his school of poetry. In 1819 also had appeared *Mazeppa* and an ode on Venice. In 1819 B. met an It. countess, Teresa Guiccioli, who for the next four years remained B.'s mistress, and was rewarded with his fidelity and constancy. He was politically the friend of freedom, the champion of liberty on the Continent, and on the Continent he earned both influence and power. In 1819 B. left Venice and went to Ravenna. Here in 1821 appeared *Sardanapalus*, *The Two Foscari*, and *Cain* (pub. together). *The Prophecy of Dante*, cantos iii.-v. of *Don Juan*, *Marino Faliero*, and *Doge of Venice*, were also pub. in 1821. In 1822 appeared the *Vision of Judgment*. In the following year appeared *Heaven and Earth, a Mystery*, and the same year was pub. *The Island, or Christian and his Comrades*, a poem suggested by the mutiny of the *Bounty*, *Age of Bronze*, and *Werner*. In 1823, hearing that he was elected

a member of the Gk. Committee, he hastened to the help of Greece and of Grecian independence with money, advice, and finally his presence. Arriving at Missolonghi in Jan. 1824, he was accorded the welcome of a king, and took an active part in the councils of the Gks. He does not seem, however, to have realised that his health was breaking down, but by the beginning of April it was obvious to all that his days were numbered, and on the 19th of that month he d., in his thirty-sixth year. His poetry has been accurately described as the poetry of glory and passion. His love of liberty characterised his poems also, and certainly in the desire to see the fettered nations of Europe free he was in the forefront of his times. Works, ed. by G. E. Prothero (Letters and Journals) and E. H. Coleridge (Poetry), 13 vols., 1898-1904; W. M. Rossetti and T. Secombe, 1911. See also L. Hunt, *Lord Byron and some of his Contemporaries*, 1828; E. J. Trelawney, *Recollections of the Last Days of Shelley and Byron*, 1858; J. Nichol, *Byron*, 1880; A. Brecknock, *The Pilgrim Poet*, 1911; E. C. Mayne, *Byron*, 2 vols., 1912; H. Nicolson, *Byron: the Last Journey*, 1823-24, 1924; A. Maurois, *Byron*, 1930; I. C. Clarke, *Shelley and Byron*, 1934; C. E. Villiamy, *Byron*, 1948.

Byron, Henry James (1834-84), Eng. dramatist, was b. at Manchester. He entered the Middle Temple in 1858. He was the first editor of *Fun*, and for many years was a popular writer of burlesques, comedies, etc. He leased sev. theatres, and appeared on the stage of them himself sometimes. For instance, in 1869 he appeared in his own drama entitled *Not such a Fool as He Looks*. His best known and most popular work is *Our Boys*, which appeared in 1875. His other works, which were numerous, include *An American Lady* (1874); *Old Sailors* (1876); *A Fool and his Money* (1880); *Cyril's Success* (1868), his best piece from a dramatic point of view; *War to the Death* (1866); and *£100,000 Sterling* (1867).

Byron, John (1723-86), Eng. vice-admiral, grandfather of the poet. As a midshipman he was shipwrecked on the W. coast of Patagonia, and was a prisoner for three years, returning to England in 1745. Having distinguished himself in the wars against France, he was put in command of an expedition of discovery to the S. seas. In the course of this voyage he explored the coasts of Patagonia, the Falkland Is., and the strait of Magellan, discovered sev. new lands, and sailed round the world. B.'s Isle, named after him, he discovered in the track from King George's Is. to Tinian. He was made a vice-admiral in 1776. Commanded the Brit. squadron in the W. Indies during the Amer. war. His *Voyage round the World in the Years 1733-48* (1767) was trans. into Fr. in 1769 and ed. by Hawkesworth (q.v.) in his *Voyages* (1773). Dr. Johnson's successor on the *Gentleman's Magazine* in 1773. He d. in London.

Byrsonima, tropical Amer. shrub of the

family Malpighiaceæ. The bark of all the species yields a brilliant red dye, and is used for tanning. Its fruit is edible.

Bysmalith, body of igneous rock which has the shape of a cone underground. Vertical displacement accompanied by faulting characterises this method of intrusion of a molten mass. Mt. Holmes, in the Yellowstone Park, U.S.A., is a good example of a B.

Byssus, group of silky fibres secreted by the foot of the mussels and molluscs, as a means of attachment to rocks. The

Bytown, former name of the city of Ottawa, Canada, under which it was founded in 1829. It became Ottawa on its incorporation in 1834.

Bytownite, rare felspar containing 14 to 18 per cent CaO and intermediate between labradorite and anorthite. Seldom occurs in crystals, but usually found in greenish-white massive, as from the original locality, Bytown (*q.v.*). A component of basic igneous rocks and sometimes the chief constituent of anorthosite.

Byzantine (coin), *see* BEZANT.



THE CHURCH OF SAN VITALE, RAVENNA

E.N.A.

B. of some rock creatures can be woven into fabrics. A delicate silk called B. is made from the B. of mussels found in the Mediterranean.

Byström, Johan Niklas (1783-1848), Swedish sculptor, b. at Philipstad. He went to Stockholm, studied for three years under Sergel, and visited Rome, 1810. His 'Reclining Bacchante' (half-size), sent home from there, won him recognition as one of the foremost Swedish sculptors. In 1816, on returning home, he brought with him a portrait statue of Bernadotte as Mars. He was prof. of sculpture at the academy, Stockholm. His best works are his female figures: 'Hebe,' 'Pandora,' 'Juno suckling Hercules,' 'Girl entering the Bath.' His huge statues of Swedish kings (Gustavus Adolphus, Charles X., XI., XII.) won great admiration. B. also did the altar decorations in Linköping Cathedral, and 'Linnæus' at Upsala.

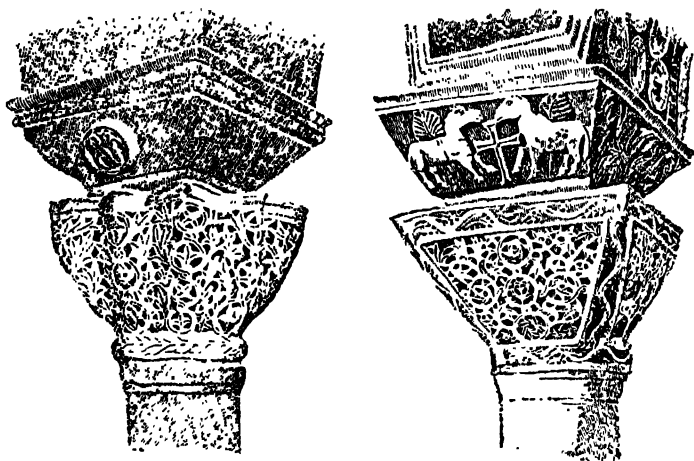
Bytom, *see* BEUTHEN.

Byzantine Architecture, style developed in the E. Empire after the settlement of Constantine at Byzantium. It continued with full vigour until the capture of Constantinople by the Turks in '53, and its influence on Mohammedan architecture in the E. has since been very great. The style is of great interest as showing the Gk. spirit working on Asiatic lines. At the founding of Constantinople in the fourth century, Rom. art was in its decadence. Already the signs of breaking up are visible, but even in the V. there are signs of the development of a new style, as in the palace of Diocletian at Spalato. At the new cap., a field was provided for the exercise of the arts, and the union of two different schools produced a new architecture. The plan remained either round or basilican in form, but the arch replaced the line of the architrave, and the dome was adopted, this last becoming the leading constructive feature. Domes were now placed over

square apartments, whereas in the old Rom. style they had only been placed over circular apartments. The square was brought to the circle by 'pendentives' which brought the four corners of the square up to form a circular base for the dome. Smaller domes are frequently grouped round a large central dome which rises from four great piers at the corners of a square. In the church (later, a mosque) of St. Sophia at Constantinople, this central square is 107 ft. long, and the length of the church is increased by the addition of semi-domes at each end. Round the lower part of the dome a

O. Demus, *Byzantine Mosaic Decoration*, 1948.

Byzantine Art. By B. A. is meant the characteristic art of the Byzantine Empire (q.v.) We can affix no absolutely definite date for its commencement, but we can practically take the period which saw the separation of the E. and W. empires as the period of the beginning of this art. It had enormous influence both upon the E. and the W., being itself also influenced by E. and W. Up to the period of the separation of the empires we may regard art as that of the classical period, and B. A. may to a very great



BYZANTINE CAPITALS FROM SAN VITALE, RAVENNA

row of windows is placed. The classical columns were also developed, no less than seven kinds of capital being evolved: the Byzantine Ionic, Byzantine Corinthian, impost, melon, bowl, bird, and basket, and wind-blown acanthus. Four of these types are found in St. Sophia. A great feature of B. A. is the internal ornament. After construction, the walls were sheathed internally with marble, the vaults being covered with coloured mosaics on a golden background. Glass, rendered opaque with oxide of tin, was generally used for this purpose. The golden period of B. A. was reached in the reign of Justinian (A.D. 527-65), when the churches of St. Sophia, SS. Sergius and Bacchus, and the Holy Apostles were erected. B. A. was carried W. by the medieval merchants, and the style is found in the churches of St. Mark at Venice, San Vitale at Ravenna, St. Front at Périgueux, etc. The Rom. Catholic cathedral at Westminster is a modern building erected in this style. See also ARCHITECTURE, *Byzantine*. See

extent be regarded as Rom. art under the influence of the E. It reached its highest point in or just after the reign of Justinian, after which it sank slowly into decadence, to rise again for a short time into prominence during the eleventh and twelfth centuries. The dominant form is essentially the characteristic of Byzantine architecture (q.v.). This was a development of the Rom. art influenced largely by Persian architecture and by Gk. culture, both of which found a common meeting-ground in Constantinople. The two chief types are the basilican type and the circular or central type. Of the latter type the chief examples are SS. Sergius and Bacchus (Constantinople) and San Vitale (Ravenna), whilst the outstanding example of the magnificence of Byzantine architecture is to be found in the church of Holy Wisdom (St. Sophia) at Constantinople. Byzantine decoration differs from that of the W., especially from that of Gothic art, since it is always flat and incised and contrasts with the bold, outstanding decoration of the Gothic

type. That B. A. had a great influence upon the W. cannot be doubted, since the influence of St. Mark's (Venice), which is essentially Byzantine, has been very great; and undoubtedly not only in architecture, but also in painting the E. was responsible for the revival of interest which culminated in the Renaissance movement. Other great features of B. A. were the mosaics and paintings. These have been condemned because of the lack of expression of the faces and the rigidity and fixity of the figures. But it is necessary to remember that it was almost impossible to represent the great scenes and topics usually depicted by B. A. in any other manner, and that the characteristic types of B. A. are also characteristic of the topic which they represent. Byzantine metal-work and carving also hold a unique place in the hist. of the art of the world. This came under very great influence from the E., and in time came to be regarded almost as a barbaric art. Ivory carving and silk pattern weaving also were developed under Byzantine influence, and reached a great pitch during the period of Byzantine greatness. See D. T. Rice, *Byzantine Art*, 1935, and C. Stewart, *Byzantine Legacy*, 1947.

Byzantine Empire. This empire is often distinguished by various other names, such as Gk. Empire, Later Empire, E. Empire, or E. Rom. Empire, and may be said to have sprung into existence with the founding of the city of Constantinople by the great Constantine. It is necessary, however, to emphasize and to keep in mind always the fact that the B. E. was essentially Rom., and carried on the ideas and ideals of the Rom. Empire for a thousand years after the empire in the W. had perished. The adoption of Christianity by Constantine and the founding of the great city of Constantinople under the B. E. essentially Christian and Rom.; it gave the new ideals of the empire a permanent abode, and for centuries, even when the B. E. seemed at its weakest, it formed the bulwark of Christian resistance to the attacks of paganism. The div. of the Rom. Empire during the fourth and fifth centuries did not add to its strength, and during this period we see the two divs. brought frequently into hostile relations with each other. Both suffered from the attacks of barbarians, and often it seemed that both divs. would succumb to the onslaughts of the vigorous races which at this time were threatening the empire. The last emperor of the W., the usurper Romulus Augustulus, was deposed by the Teutonic general Odoacer, who set up for himself a kingdom in Italy, divided the land amongst his soldiers, and intimidated to the emperor at Constantinople (Zeno) that it was unnecessary to have two rulers of the empire, and that in future Italy would look to the emperor at Constantinople as its head. Perforce Zeno had to be content. During the period which had just passed, and in the years which immediately followed, the W. Empire had been broken up. Britain was abandoned, Spain was in the hands of the Visigoths,

Gaul was being conquered by the Franks, N. Africa was in the hands of the Vandals, Rome itself was ruled by the authority of a barbaric and vigorous Ger. soldier.

In the E. affairs had not assumed a much lighter hue, the Balkan peninsula was inhabited by Slavonic tribes, the Ostrogoths threatened the cap. itself, but the danger passed. The Ostrogoths migrated under their great leader Theodoric to Italy, the fields of Italy were their share of the spoil, the Ger. kingdom was replaced by the rule of Theodoric and his Ostrogoths. Theodoric, although nominally the subject of the emperor, was essentially independent. Under his guidance Italy flourished, and it would probably have been better for Italy had a strong line of Ostrogothic kings been able to follow Theodoric and carry out his policy. But Theodoric d., to all intents and purposes, without heirs, and the kingdom fell swiftly before the attacks of the E. Empire and the Lombards. The emperors at Constantinople were once again able to assert their sway over Italy, and indeed actually to rule part of it. Zeno had been succeeded in 491 by Anastasius, and he was in turn followed by the founder of the Justinian dynasty in 518. Justinian I. succeeded in 527 and ruled until 565. He had to the full the ideas and ideals of the great Rom. Empire. He aspired to restore some of her original boundaries, to make her great in war and peace, in art and commerce, in extent and religion. On every side during his reign we see considerable progress. The kingdom of the Vandals, weakened by the excesses of a barbaric race new to civilisation, fell before the vigorous onslaught of the Rom. general Belisarius, the resistance of the Ostrogoths was overcome and a large part of Italy restored by the feats of Belisarius and Narses, part of Spain was reconquered, and on the whole it appeared that the greatness of the Rom. Empire would be restored. In the realm of law Justinian was equally famous, and his Code is in itself enough to perpetuate his name. But during his reign faction fights came to a climax and were waged more fiercely than ever. The great work of the rebuilding of the empire commenced by Justinian was undone by his successors, and it must be conceded that the weakness of the empire immediately after the death of Justinian was due to a great extent to the policy of that emperor. His schemes were magnificent, his ideals mostly good, but the empire could not bear the expense of continual war and conquest. The period which falls between the death of Justinian (565) and the succession of Heraclius (610) is the darkest of all periods in the hist. of the empire.

In that time the Lombards conquered part of Italy, continual war took place with the Avars, war was almost continuous with Persia, and the gates of empire were about to be threatened by a worse foe than the Persians—the Saracens. In the time of Phocas and Heraclius the Asiatic provs. were slowly but surely falling into the hands of the Saracens. The strain of gov. broke Heraclius, and then

followed a period of almost complete anarchy. The empire was beset with enemies, the Saracens conquered most of the Asiatic provs., the Bulgars brought the empire to her knees and extracted tribute. Syria had fallen long before. Egypt was conquered, N. Africa fell into the hands of the all-conquering Saracen. The power of Islam seemed to be irresistible; the struggle of Cross and Crescent appeared to be on the verge of being settled in favour of the Crescent, but on two occasions, when the danger seemed the greatest, the empire was saved by her cap. Twice was the cap. besieged by the Muslims, and twice were the attacks beaten off; on both occasions Gk. fire helped largely in the saving of the city. The Heraclian dynasty came to an end in blood and anarchy, and the Syrian Leo III. became emperor (Leo the Isaurian). It is necessary to point out here that by this time the B. E. had become essentially Gk. The institutions were still Rom., but the prevailing spirit was Gk., and had been so almost from the time of the end of the reign of Justinian.

With the beginning of the Isaurian dynasty we see the commencement of better times for the empire. The iconoclastic policy of the emperor, however, has overshadowed his greatness. The army and the finances were reorganised, and the Saracens were repulsed. But the exarchate of Ravenna was lost, and some more provs. fell into the hands of the Saracens, but on the whole the rule of Leo was good. Unfortunately the controversy which for one hundred years was to shake the empire began. This was the question of image-worship. The hist. of the period of Isaurian rule is the hist. of constant struggle with Bulgar, Saracen, and Russian, and also of continual religious dispute. Under Constantine VI., the great-grandson of Leo III., the power passed from the hands of the emperor to the hands of his mother Irene. She caused her son to be blinded and usurped the power. She d. in 802, after she had vainly attempted to negotiate a marriage with Charles the Great, who by his restoration of the W. Empire in 800 had finally and irrevocably separated the two empires. The war with the Bulgars and with the Saracens continued. Constantinople was again besieged in 815, and Crete and Sicily passed into the hands of the Saracens. Under Theodora, the widow of Theophilus, the iconoclastic controversy was brought to an end by the Council of Nicea in 842; image-worship was recognised and restored. In 867 the Isaurian dynasty finally came to an end, and Basil I., the Macedonian, founded the Macedonian dynasty, which lasted until almost the end of the eleventh century. The rule of the Macedonian emperors was noted for its vigour and ability, and during this period the Gks. more than held their own with Saracen, Bulgar, and Russian. At the beginning of the eleventh century (1028) the power of the empire passed into the hands of the Empress Zoe, the wife of Romanus III., who caused her husband to be assassi-

nated, and raised in rapid succession to the imperial throne Michael IV., Michael V., and Constantine IX. In 1054 Theodora, the sister of Zoe, was made empress. Michael VI. was chosen by Theodora as her successor shortly before her death in 1056. He was forced to abdicate by Isaac I. (Comnenus), who had defeated his army in Phrygia (Aug. 1057), and spent the rest of his life in a monastery. New enemies now appeared, however. The It. possessions of the empire were being attacked by the all-conquering Normans, whilst on her E. frontiers a more formidable enemy than the Saracen appeared. The Saracens had been driven out in turn by a fierce, warlike tribe from the interior of Asia—the Seljukian Turk. The destined conquerors of the E. Empire had at last reached the frontiers. The appearance almost at the same time of the Normans and the Seljukian Turks boded ill for the empire. The emperor appealed to Europe for help against the Seljukian Turk, and his answer was to him at least unexpected and unwelcome—the first crusade. Conquests made in Asia Minor were restored to the emperor, but the foundation of the Lat. kingdom of Jerusalem was a crushing blow to the empire of the E. The emperors saw full well that a Lat. kingdom in the E. meant that the chief routes to that kingdom would lie in their ter, or over their seas, and that it would be necessary now to protect the empire from the W. as well as the E. The hostility thus engendered between the E. and the W. was made much worse by the continual quarrel between the Rom. and the Orthodox churches. The papacy aimed at unity of empire and church—by peaceful means if possible, but if not by any or all means. The emperors themselves began to revive the old ideals of a universal empire, which they hoped to establish by means of the hostility of the papacy to the empire (W.). The policy of the Normans was undiscussably that of the overthrow of the E. Empire. The W. policy of the Emperor Manuel Comnenus was very unpopular in the E. Empire, and he was overthrown. The empire was not strong, taxation and oppression had permanently weakened it, the Bulgars were strong enough to reassert their independence, and with the beginning of the thirteenth century came the overthrow of the empire. Isaac Angelus and his son, who had been driven from Constantinople, came westward and joined the forces who were preparing for the fourth crusade. They persuaded the leaders, in spite of the opposition of the papacy, to turn aside to Constantinople and to restore them to the throne of the empire. Isaac Angelus was restored, but the newly restored emperor was unable to fulfil his promises to reconcile the Gk. and Rom. Churches and to aid the crusaders. The partition of the empire was agreed to by the crusaders, and a Lat. Empire was set up, an empire founded on purely feudal lines, which did more than anything else to disintegrate the E. Empire and to prepare it for its ultimate fate at the hands of the Turks.

Venice, a rising and increasing power, had seen that the newly estab. empire should not be a menace to her own power, and the decline of the Lat. Empire was remarkably rapid. The crime of the sacking of Constantinople, and the breaking up of the empire, was, however, unpremeditated; circumstances had played into their hands, and the leaders of the fourth crusade merely took advantage of that fact. The empire was divided up, and all the states were made subordinate to the Lat. emperors, the first of whom was Baldwin of Flanders. Opposition to the Lat. Empire was quickly organised. Ten years after its commencement it had begun to decline, and in 1261 Constantinople was captured by the Gk. emperor, Michael Palaeologus. The next century and a half marked the increase in power of the Turk and the Serb. The Serbs, after crushing the Bulgars, were themselves finally crushed towards the end of the fourteenth century by the Turks. The Turks gradually won possession after possession of the E. Empire in Asia Minor, and then, about 1360, crossed over to the mainland of Europe, and gradually conquered the whole of the Balkan Peninsula and threatened Hungary. At the beginning of the fifteenth century the Mongol defeat of the Turks checked their career, but by 1420 they had recovered, and Constantinople was again attacked. In 1443 the Christians, who had rallied to the help of the empire, won a victory which, however, was fully avenged in 1444 at Varna. In April 1453 began the final siege of Constantinople, and in May the walls were breached and the city taken, the Emperor Constantine XI. falling in the final assault. The city was captured on May 29, 1453. With the fall of Constantinople we can say that the E. Empire fell. By 1460 the whole of the Balkan Peninsula was in the hands of the Turks—an inevitable sequel to the Norman expansion eastward and the Turkish westward.

Bibliography: J. B. Bury, *History of the Later Roman Empire from the Death of Justinian, A.D. 345 to A.D. 565* (2 vols.), 1923; C. Diehl, *History of the Byzantine Empire* (Princeton), 1925; N. H. Baynes, *The Byzantine Empire*, 1925; S. Runciman, *Byzantine Civilisation*, 1933.

Byzantine Literature, literature written in Gk. from the period when Constantine moved the cap. of the Rom. Empire to Byzantium until the fall of the city in 1453. This literature is vast in extent, and its value in many depts. of learning is considerable. The exact period of its birth is unknown, as its earliest works almost fall in with the Graeco-Rom. period, but its beginning may be placed about the reign of Justinian. The architects of this period were mathematicians, and produced sev. works on mechanics. In hist., though no great genius appears, there is an innumerable host of small historians and chroniclers who wrote not only on the hist. and customs of their own city, but also universal hist. Beginning with Agathias

in the sixth century, some names of these are Anna Comnena, Cinnamus, Nicephorus Gregoras, Michael Ducas, Georgius Phrantzes, and Laonicus Chalcondyles. In addition to these, Procopius wrote a Byzantine hist., Eusebius a universal hist., Proxagoras a hist. of Constantinople, Nicetas Acominatus a hist. of the Byzantine emperors. These are but a few of a host of writers, many of whose works were collected by Niebuhr and others and pub. in 1828-53 as the *Corpus Scriptorum Historiae Byzantinae*. Rhetoric was also cultivated, the chief names being those of Johannes Doxopater, Alexis Comnenus (emperor), Georgius of Cyprus, and Demetrius Cydones. The study of the philosophies of Plato and of Aristotle never ceased from Proclus in the fifth century till the great Michael Pselius in the eleventh, though this study was not a favourite one. The discussion of theological problems engaged most of the great intellects of all ages. The well-known names of Chrysostom, Cyril, Photius, and Gregory of Nazianzus rank first, and in the fourteenth century come those of Nicephorus Gregoras, Johannes Cantacuzenus, and Cyparissiotis, and this list might easily be added to. Some original poetry was written, though not of a high order, by Pisides, Theodosius, Prodromus, Philas, etc. The study of the anc. authors was carried on with great vigour, but hardly anything of great value was written in any of the commentaries. Among Byzantine scholiasts may be named Tzetzes, Eustathius, Moschopoulos, Thomas Magister, and Triclinius. See C. Krumbacher, *Geschichte der byzantinischen Literatur*, 1897.

Byzantium, an-t. Gk. city on the shores of the Bosphorus, occupying the most easterly of the seven hills of modern Istanbul (Constantinople). It was founded by a body of Megarians about the year 657 B.C., and quickly, owing to its position, became a settlement of considerable importance. The settlement was destroyed by the satrap Otanes, in the reign of Darius Hystaspes, but was recolonised by Pausanias the Spartan, who took it from the Medes after the battle of Plataea (479 B.C.). A few years after this second settlement, Cimon (son of Miltiades) seized it from the Spartans, but in 440 B.C. the city revolted and returned to its former allegiance under the Athenians. When Pausanias founded the second settlement there flocked to the city a mixed pop. of Athenians and Spartans—whence the subsequent conflicts. During the Peloponnesian war (431-404 B.C.) the city was a constant source of contention between the Athenians and the Spartans, falling into the hands of each party in turn, and continuing to change hands even after that war and until it achieved its independence of both, only to fall into the hands of the Macedonians. Before this, however, it passed through many vicissitudes. Clearchus, a Spartan general of the fifth century B.C., became harvest of B., but in his absence the city was surrendered to the Athenians. Subsequently Clearchus (q.v.)

was sent into Thrace to protect the Gk. colonies, but was recalled by the ephors. He refused to obey and made himself master of B., ruling as a despot and thereby alienated the sympathies of the Athenians. Alcibiades, after a close blockade, won the city through the treachery of the Athenian party, and thereafter B. remained the ally of Athens until it was recaptured by Lysander (405 B.C.). Under the Spartans it was in danger of pillage by the Ten Thousand (see TEN THOUSAND, EXPEDITION OF THE), who were, however, repressed by Xenophon. In 390 B.C. Thrasybulus, the Athenian, succeeded in wresting the city from the Spartan oligarchy and in restoring democracy and the Athenian influence there. After resisting an attempt by Kpanimondas to restore it to the Spartans, the city co-operated with Rhodes, Chios, and other Ægean is. states in securing their independence of Athenian suzerainty; but, on the advance of Philip of Macedon against B., the city quickly sought the help of Athens. Under Phocion, the Athenian statesman and general, Philip was forced to raise the

siege. The deliverance of the city through the 'miraculous' flash of light, which revealed the advancing Macedonian host, so appealed to the imagination of the Byzantines that they erected an altar to torch-bearing Hecate and impressed a crescent on their coinage as a symbol of the portent. B. struggled against and repelled threatened invasions of the Gauls, and for some time enjoyed a certain amount of independence. It became an allied city of Rome, but was later reduced to the position of an ordinary Roman colony. Severus attacked and captured it, levelling it to the ground, and afterwards rebuilding a considerable portion of it. Constantine, seeing the advantages of the natural position of the city, made it his new cap., and built a magnificent city there. The new cap. of the Rom. Empire was inaugurated in A.D. 330. The emblem of the crescent was adopted by the inhab. of B., and was afterwards adopted by the Turks during their possession of the city. The tn. received the name of Constantinople when it was rebuilt and occupied by Constantine.

C, third letter of the Rom. alphabet, had originally (in the Semitic, Gk., and Etruscan alphabets) the shape of 4 (Semitic), 7 or f (Gk.), and > or < (Etruscan), becoming rounded in the Etruscan and Rom. alphabets, 3 or C. Its sound was originally (in the Semitic and Gk. alphabets) that of *g*. The Etruscans, knowing no distinction between *k* and *g*, employed the letter C both for *g* and *k*. When the Romans adopted this letter they continued to employ it for *g* and *k*, but in 312 B.C. they created a new letter for the sound *g* (adding a bar to C: G), retaining the letter C for the sound *k*. Consequently, when the letter C was introduced into Britain, it was used only to represent the hard sound of *k* (cf. O.E. *cyn*, *brican*, *roc*, with Mod. E. *kin*, *break*, *rock*). In It., Fr., and Eng., C retained the sound *k* when followed by *a*, *o*, *u*, or a consonant other than *h* (cf. O.E. *call*, *corn*, *cuman* (come), *clāw*, with their modern equivalents); ... before *e*, *i*, *y*, it tended to become palatalised to a sound resembling *sch*, *sch*, and finally *ch* (cf. Lat. *castra*, a camp, with O.E. *ceastre*, Mod. E. *Chester*). When, in Eng., C retained the *k*-sound before *e*, *i*, and *y*, it was written *c* to avoid confusion. The palatalised C before *e* and *y* was written *ch*, as in Fr. *thus*, O.E. *rice*, *child*. O.E. *cw* was abandoned, and the Fr. *qu* or *qu* adopted (cf. O.E. *cwēn*, M.E. *quene*, and Mod. E. *queen*; O.E. *cweðan*, Mod. E. *quoth*). See also ALPHABET.

C, in music, is the name applied to one of the notes of the gamut. The scale of C major is called the natural scale, because it has neither sharps nor flats. The scale of C minor has three flats, E, A, and B. C is also used to represent common time, i.e. four crotchets in a bar.

Caaba, see KAABA.

Casing Whale, see CA'ING.

Cab, form of horsed vehicle, with two or four wheels, for carrying passengers. At the beginning of the nineteenth century the *cabriolet de place*, invented about 1660 by Nicholas Sauvage, was introduced into London from Paris. The first eight licensed cabs—this shortening was adopted as early as 1825—appeared on London streets in 1823. Besides the driver they could carry two passengers inside and were run for fares which were one-third less than those of the hackney coach. A contemporary newspaper refers to the fact that 'cabriolets were in honour of his majesty's birthday introduced to the public this morning' (April 23, 1832). These Cs stood for hire in Portland Street, W., were painted yellow, and were limited in number to twelve. But the limit to their number was soon removed in spite of vested interests, as their popularity

increased so fast. The cabriolet which had superseded the old hackney coach (Pepys's 'hackenée') was in its turn supplanted by a new kind of C. invented by M. Boulton. In this vehicle the occupants faced one another and the driver sat on top. Finally in 1836 a larger C., a cheaper imitation of the brougham, came into use. The Clarence four-wheeler was only an improvement of this design. As a rival to the 'growler' the 'hansom' (invented by Joseph Hansom) was patented in 1834. This consisted originally of a square framework on two wheels with a 7½-ft. diameter (see illustration, p. 84). Its good speed, due largely to its lightness, and its spruce appearance and pleasant bounding motion, made it a matter of regret to many when this means of street locomotion was superseded in the metropolis by the taxi-C. (motor). In 1886 there were 3997 four-wheelers and 7020 hansoms in London. The advent of the petrol-driven vehicle discouraged manufacturers from patenting further improvements such as indiarubber tyres, etc., for horse-drawn Cs. Cabmen's shelters, first estab. in 1875, by providing accommodation for drivers on the stands did much to encourage sobriety. Taximeters have been widely extended to ordinary hackney carriages. These are mechanical contrivances which register the fare—the calculation of the amount being made on a combined basis of time and distance. The Acts which regulate the traffic of hackney carriages or Cs. in London are the Hackney Carriage Acts, 1831-53; the Metropolitan Public Carriages Act, 1869; the London Cab Act, 1896; and the London Cab and Stage Carriage Act of 1907. These Acts protect drivers against fraudulent passengers, regulate the licensing, lighting, and stand for the Cs., and also state the just fares and the rules for hiring. Licences, which are only granted to men of approved character who have satisfied the authority that they have studied the topography of the place, are issued by the commissioner of police, who is authorised to do this by the home secretary.

Cabal (Fr. *cabale*, Heb. *kabbālāh*, something received with an idea of secrecy). The word 'cabal' with the meaning of 'club' or 'association of intriguers' had been popularly applied to the secret councillors of the king even under James I.; and the accidental coincidence that, in 1671, the Cabinet consisted of the five unprincipled ministers of Charles II., Clifford, Ashley, Buckingham, Arlington, and Lauderdale, the initials of whose names made up the word cabal, caused the latter designation to be used for some years as synonymous with cabinet, and did much to bring the cabinet system of

government into disrepute. Moreover, though convenient and even necessary for administrative purposes, cabinet government, in the form it assumed at this period, was unquestionably fraught with dangers, because it deprived the Privy Council of all power to check the actions of the king, and vested the real government of the country in a clique of ministers practically irresponsible to the nation. The word cabal is now applied to any intriguing faction that works in secret for private or political ends.



HANSBOM CAB

E.N.A.

Caballero, Francisco Largo (b. 1869), Sp. republican leader; was a mason by trade. Prominent in trade union organisation. Chairman of the Sp. Socialist party. Frequently imprisoned for his advanced political activities and sentenced to death in 1917, but released. From 1931 to 1933 he was minister of labour in the gov. of Azana (*q.v.*). Arrested temporarily by the Lerroux Gov., 1934. In Sept. 1936, during the Sp. civil war, he became Prime Minister of the Republican Gov., and it was in him that all hopes of Republican victory were centred. The Cortes unanimously granted to C. and his colleagues dictatorial powers to work for the final triumph of the Republican cause and suspended its sittings *sine die*. C. introduced conscription for all areas under the gov.'s control and launched an offensive against Franco's forces N. of the cap., and for a time those forces were held in check. But Franco, helped by Germany and Italy, was stronger at sea, and when, in Feb. 1937, Málaga fell, the gov.'s chances in the whole war were fatally prejudiced. In the late spring of that year C. was superseded by Dr. Negrín, his fall being due partly to the disaffection of the Communist party and partly to Azana's dislike of extremism. On the fall of the republic he took refuge abroad.

Cabanatuan, cap. of the prov. of Nueva Ecija, Philippines Is., and one of its chief commercial centres. Pop. 15,000.

Cabanel, Alexandre (1823-89), Fr. painter, b. at Montpellier and studied under Picot. Attention was first called to him by his 'Death of Moses' (1852), and

his reputation was thoroughly estab. by the works which followed: 'St. Augustine and St. Monica' and 'The Florentine Painter.' C. distinguished himself in *genre*, historical, and portrait paintings. Other works of his are 'The Christian Martyr,' 'The Birth of Venus,' and 'Adam and Eve.'

Cabanis, Pierre Jean Georges (1757-1808), Fr. physician and writer, b. at Cosnac, Corrèze. During the revolution he acted as physician and friend to Mirabeau; in 1797 he was made clinical prof. in the medical school at Paris, he was elected to the Five Hundred, and, under Napoleon, became a member of the Senate. C. wrote extensively on medicine and on metaphysics. Consult Dubois, *Examen des doctrines de Cabanis*, 1842, and Labrousse, *Quelques notes sur Cabanis*, 1903.

Cabaret, Fr. word which in its original signification meant simply a booth or wooden shelter. Its use to-day is restricted to that of a small tavern or wine-shop. In a more popular sense it denotes the entertainment—singing and dancing—in hotels and restaurants after theatre hours.

Cabatuan, municipality in the Philippines Is., 15 m. N. of Iloilo. Pop. 15,000.

Cabbage (*Brassica oleracea*), native to Britain, though it has been said by Alphonse de Candolle that it is in reality descended from the one or two species still to be found growing wild on the Mediterranean coast. In any case the cultivated varieties now differ very much from the original kind. The wild C. is a somewhat insignificant plant, growing from 1 to 2 ft. high, resembling in appearance the corn mustard, the only difference being its smooth leaves. The following is a classification of the sev. kinds of cultivated Cs.: (1) All the leaf-buds active and open, as in the wild C. and kale. (2) All the leaf-buds active, but forming heads, as in Brussels sprouts. (3) Only the terminal leaf-bud active, forming a head, as in common C. (4) The terminal leaf-bud alone active and open, with flowers abortive and succulent, as in cauliflower and broccoli. (5) All leaf-buds active and open, with the flowers abortive and succulent, as in sprouting broccoli. A very interesting variety of C. is grown in the Channel Is., known as the Jersey C. Its usual height is about 8 ft., but it has been known to reach a height of 16 ft. The central stem is so woody that it is used for the making of walking-sticks. Some varieties are even cultivated as ornamental plants on account of the beauty of their leaves in form and colour. Brussels sprouts resemble miniature Cs. Nothing seems to be known as to the origin of the plant, but according to Van Mons (1765-1842) it was heard of in 1213 by the name of *spruylen*. It is most hardy and productive, and ready for use in Nov., and lasts till the following March. The savoy is a hardy green variety, with the characteristic of producing very crinkled leaves. The cauliflower is said to have been brought from Cyprus, where it appears to have been cultivated for ages. It grows well in a

rich soil, with a sheltered position, and is a vegetable with a most delicate flavour. Broccoli is a variety of cauliflower. The earliest sowing of C. should be made early in March, to be ready for use in July and Aug., and another sowing should take place at the end of March, to ensure a supply from Aug. to Nov. The most important of all is the autumn sowing, which should be made the last week in Aug. Kohl-rabi cabbage (*Brassica oleracea caulorapa*), with a turnip-shaped stem, is used in England as food for cattle. The C. is a biennial, and to obtain seed for future use plants should be left until the second year.



CABBAGE

Left: Wild cabbage. Right, upper: Garden cabbage
Right, lower: Savoy

Cabbage-bark Tree (*Andira inermis*), evergreen tree of the order Leguminosae, indigenous to the W. Indies. It has leaves about 12 in. long, with purple flowers. Its bark is useful as an antidote to intestinal worms.

Cabbage Butterfly is a name common to sev. species, the larvae (caterpillars) of which feed on the leaves of cruciferous plants, especially of cabbages. The large white (*Pieris brassicae*) is a very common species in Great Britain. The expanded wings measure 3 in. across, and are white with black edgings. The female, which is the prettier, having black spots on the upper surfaces of the wings, lays her yellow eggs in clusters on the leaves of caterpillar food. The fully grown caterpillar sometimes measures 1½ in., and will eat twice its own weight of leaf in twenty-four hours. After it has hung for some time by its tail from a ledge, it is changed into a shining pale green chrysalis. The butterfly, which, in the case of the autumn brood, waits till winter is past before coming out, lives daintily on nectar. The small white, or turnip butterfly (*P. rapae*), has a wing expansion of about 2 in., lays its eggs singly on the

under side of vegetable leaves, and produces a velvety caterpillar which devours the hearts, instead of merely the leaves, of cabbages. It is often, therefore, a still more dangerous pest than the large white. The chrysalis is brownish-yellow with black spots. The third species, the green-veined white butterfly (*P. napi*), which is similar to the small white, cannot multiply so fast, because both the butterfly and its caterpillar are a favourite food of small birds. A watch should be kept for eggs of cabbage whites, and when found they must be destroyed. Cabbages should be dusted with Derris, or other insecticide, prevention of an attack being easier than a cure. Ichneumon flies parasitise the caterpillars and help to control them.

Cabbage Palm, or Cabbage Tree. There are many different species, the prin. being the *Areca* (or *Roystonea*) *oleracea*. It is a native of the W. Indies, where it often grows to the height of 100 ft. It owes its name to the fact of the terminal bud being edible and in form resembling a cabbage. The removal of the terminal bud quite destroys the tree.

Cabbage Wood, see PARTRIDGE WOOD.
Cabbala (Heb. *kabbalah*, something received, hence tradition), the designation of a mystic system of philosophy, theosophy, and magic, once prevalent among the Jews. Its popularity began in the twelfth century and continued till the sixteenth. It has now few adherents—these for the most part in E. Europe. The Cabbalists taught a pantheistic doctrine that there was one Being and that nothing existed but this one Being and its manifestations. God, therefore, was an Absolute Being, and from Him emanated ten attributes—wisdom, understanding, mercy, and the like—that as this Being became conscious of its existence, it poured itself through 'channels' into the world of pure spirits and angels, and into the lower world, which thereupon came into existence; that the soul of man passed from body to body, till it finally returned to and became absorbed in God. Their teaching was obviously influenced by the idealistic philosophy of Plato, combined with the degenerate philosophies of the Neoplatonists. The Cabbalists attached much significance to numbers. The fact that every letter in Heb. stands for a number enabled them to read into the Scriptures many strange doctrines. Every passage was regarded as symbolic. It was claimed that their doctrine had been revealed, according to some, to Abraham, and, according to others, to Adam; the tradition was passed on by word of mouth until it was felt necessary to put the mystic lore into written form. The authoritative documents of C. are (1) the *Sefer Jezirah*, 'Book of Creation,' supposed to have been written by Rabbi Akiba (d. A.D. 135). (2) The *Sefer Hazzohan*, 'Book of Light,' commonly called Zohar. It is written in a form of Aramaic which shows it to have been composed in the twelfth or thirteenth century, and some have suggested that the author might have been Moses de Leon of Spain.

Other Cabbalistic writers were R. Moses ben Nachman, better known as Ramban (1195-1270); Pico della Mirandola (*Conclusiones Cabbalisticæ*, 1517). See K. von Rosenroth, *Kabbala Denudata*, 1677-78, and C. D. Ginsberg, *The Kabbala*, 1865.

Cabeiri, *Thē*, see **CABIRI**.

Cabell, James Branch (b. 1879), Amer. novelist and genealogist, b. at Richmond, Virginia. He was teacher of Fr. and Gk. at William and Mary College, 1896-97; graduated 1898. Considerable journalistic experience. He first came into notice with his novel *Jurgen*, attacked for immorality, and temporarily suspended. The background of sev. of his stories is the fanciful country of Poictesme, notably the series referred to as the 'Biography of Manuel,' purporting to trace the lineage of its nobility from Dom Manuel, count of Poictesme, to his Virginian descendants. He has been criticised for 'the opulent monotony of his decorative manner.' Among his romances are *Gallantry* (1907); *Chivalry* (1909); *The River in Grandfather's Neck* (1915); *Jurgen* (1919); *The Silver Stallion* (1926); *Something About Eve* (1927); *Townsend of Lichfield* (1930); *These Restless Heads* (1932); *Smirt* (1934); *Preface to the Past* (1936); *The King was in His Counting House* (1938); *The First Gentleman of America* (1942). See C. van Doren, *James Branch Cabell*, 1925, and G. Holt, *Bibliography of the Writings of James Branch Cabell*, 1924.

Caber, **Tossing the**, is especially a Scottish sport—a conspicuous event in most Highland games. It consists in throwing a slim tree-trunk, often 20 ft. long, in such a way that, after spinning in the air, it will fall in a straight line with the 'tossor,' the smaller end being farthest from the thrower. The C., the diameter of whose thin-end should not be more than 3 in., must be hurled as far as possible from the thrower.

Cabes, or **Gabes**, oasis of date palms in Tunis with 20,000 inhab., including 1500 Europeans. It exports dates.

Cabet, Etienne (1788-1856), Fr. Communist and a leader of the Carbonari, was the son of a cooper of Dijon. Under Louis-Philippe he became procureur-général of Corsica. Bitter attacks on the gov., made in the Chamber of Deputies of which he was a member, led to his voluntary exile in England (1834). On his return to France in 1839, after the declaration of a general amnesty, he pub. a fierce hist. of the Fr. Revolution in four vols. (1840), and later, in his *Voyage en Icarie*, a romance wherein he expressed his communistic ideals. Determined to put some of them into practice, he sent out in 1848, with the approval of Robert Owen, a colony of 1500 'Icarians' to a tract of land in Texas. But the community of property, which was to have been the special feature of the settlement, proved an utter failure. In 1849 C. himself sailed to America and transferred the settlers to Nauvoo in Illinois. For a time he ruled his little band like an autocrat, but was finally banished in 1856, the year of his death at St. Louis.

Cabeza del Buey (head of the bullock),

tn. of Spain, in the prov. of Badajoz, 86 m. E. by S.E. of that city. There are manufs. of linen and woollen goods. Pop. 12,000.

Cabildo, or **Ayuntamiento**, corporation of old Spain which has been likened by some writers erroneously to the municipal councils of England, but which in no way resembled them. The Cs. owed their creation to the desire of the Sp. monarchs to curb the power of the nobles, and if an illustration be sought more fully to explain their nature, it may be looked for in the medieval It. republics. The 'illustrious Cabildo' existed throughout the Sp. Empire, and under Sp. rule Trinidad too had its C. The C. played so prominent a part in the hist. of Trinidad, not only under the former rulers of the colony but even after Abercromby had captured it for England, that its minutes are still valuable records of events in the former administrative life of the colony. The term *cabildo* signifies a 'congress or assembly,' composed of the chief magistrates, aldermen, and others, charged with the administration and internal gov. of a tn.; and it appears that the Cs. date from a period in the hist. of Spain when the grantees, taking advantage of the great judicial powers conferred on them at the foundation of the monarchy, began to tyrannise over the middle and lower classes, and to aspire to entire independence and even to usurp the rights of the monarch himself.

In order to prevent the evils resulting from this state of things, the Sp. kings, in the eleventh and twelfth centuries, estab. the Cs., or councils of the people, confiding to them civil and criminal jurisdiction, as well as all matters of municipal gov., but reserving to themselves the right of hearing appeals and complaints from persons dissatisfied with the decision of these tribunals. In each tn. the C. was composed of the heads of families or notables—persons who, either from social standing or wealth, wielded a certain influence—and in it were discussed and regulated all questions touching the public weal. The alcaldes or magistrates for the year, as also the other officers of civil and criminal justice, and all the functionaries charged with the internal administration of the tn., were also elected from, or appointed by, the C. Cs. existed in all the Sp. colonies, but of course had to undergo certain modifications, rendered necessary by circumstances. S. America, for instance, was governed by viceroys having under them provs. ruled by captains-general, whilst colonies like Trinidad were placed under governors, supreme in military matters, but who, for purposes of civil gov., were only corregidores of their Cs. See L. M. Fraser, *History of Trinidad*, 1891.

Cabin (It. *capanna*, Sp. *cabaña*): 1. Small room in a ship used as a sleeping apartment. A swinging hammock or cot is sometimes called a hanging C. 2. Rude shelter or hut, small house or cottage. Also a temporary shelter for stores.

Cabinda, or **Kabinda**, cap. and the name of a ter. in Portuguese W. Africa, in the dist. of Angola, N. of the Congo. Has

a coast trade and builds boats. Pop. over 9000.

Cabinet, term recognised by the conventions of the Brit. Constitution, but not by the law, applied to the body of men who are chosen from the political party in power to fill the highest executive offices in the state, and who, by their apparently or really unanimous policy, direct the gov., and are collectively responsible for every act of the Crown.

History of the Cabinet.—There were indications of an inner council of the state before the Tudor period, but they are of an indefinite nature. Even before the Conquest there always existed a body of advisers of the Crown distinct from the General Assembly. After the Conquest that body was known as the Continual Council or Concilium Ordinarium, and was in effect a permanent committee of the National or Common Council which became merged in the larger assembly whenever it was convened. Nominally, this committee was the instrument of the royal prerogative. Under the weaker monarchs it was virtually independent. Then the Common Council gradually evolves itself into the National Parliament, and the Concilium Ordinarium becomes a strictly official body distinct from it and wielding enormous executive powers, its members being bound by a special oath of fidelity and secrecy. During the reign of Henry VI. a nucleus forms within the Concilium Ordinarium called the Concilium Privatum, or Privy Council, constituting the king's constitutional body of advisers, while the Concilium Ordinarium, no longer consulted on executive matters, lapses into a body of legal advisers or figures in the Star Chamber. The Privy Council continued to be the king's advisers down to the reign of Charles II. That monarch found its numbers too large and the restraints it imposed on his actions irksome. He therefore resorted to the practice of confiding in a 'cabal' or clique of confidants. Sir Wm. Temple eventually persuaded him to agree to the alternative plan of forming a select committee of the Privy Council, called the C. Council. This distinction between the C. and the Privy Council has existed ever since that time, although the C. Council, or C., in its present form dates rather from the revolution of 1688 or shortly after. The Privy Council has at the present day no executive or deliberative functions, but is really that part of the constitutional machine which exists for the purpose of carrying into effect the decisions of the C. The Cs. of William III. and Anne were chosen from both Whigs and Tories for the most part. William III. was strongly opposed to gov. by party, but from force of circumstances began after 1693 to entrust the chief administrative offices to the Whigs. The resulting body was popularly known as the Junto. When the Whigs went out of power the ministry did not feel compelled to resign. Queen Anne was especially averse from party gov. and it was only after the accession of George I. that party gov., or parl. gov. by means of a ministry com-

posed nominally of king's servants but actually of an executive committee representing the will of the majority in the House of Commons, becomes finally and firmly estab., a result due rather to the fortuitous circumstance that both that monarch and George II. acquiesced in the domination of their ministers, and absented themselves from the deliberations of the C., partly because they could not understand Eng. and Eng. affairs, and partly because they preferred to devote their energies to Hanover. Finally, on the advent of Pitt's ministry of 1783, the idea of a C. consisting of men willing to serve under a Prime Minister, and to adhere to a definite programme, became an estab. necessity.

Characteristics and Nature of the Modern Cabinet.—The C. or ministry of the day is a committee of leading members of the two Houses of Parliament nominated by the Crown, but consisting exclusively of statesmen whose opinions on the most important questions of the time agree in the main with the opinions of the majority of the House of Commons. The C. now invariably includes the six secretaries of state, the first lord of the treasury, the chancellor of the exchequer, the lord chancellor, and the president of the Council (until the formation of the Irish Free State (Eire) it also included the now defunct lord-lieutenant of Ireland or his chief secretary). In recent years the secretary for Scotland, the minister of agriculture, the president of the board of trade, and the ministers of health and labour, together with the secretary of state for dominion (now commonwealth relations) affairs, have been members. A novel feature in 1912 was the inclusion of the attorney-general. Sir Rufus Isaacs (Earl Reading). Nearly all the members of the C. are chiefs of depts., but frequently one or two experienced ministers are included for the sake of their advice, and to these are assigned such offices as Lord Privy Seal or chancellor of the duchy of Lancaster. The postmaster-general and the first commissioner of works are sometimes but not necessarily members of the C.

The result of the estab. of our system of gov. upon a representative basis is that the C. is collectively responsible to Parliament for the policy it pursues, and, in theory, the members of the C. are obliged to stand or fall together, and to act as one man on all questions relating to the executive gov., so that if one of them dissents from the rest on a question too important to admit of compromise, it is his duty to resign. When the policy of the C. no longer commands the approval of the majority of the House of Commons, the ministers are in duty bound to resign *en bloc*.

The C. is presided over by a chief who is conventionally known as the Prime Minister or Premier, but is unknown to the law except in his capacity of first lord of the treasury, or as holder of some other executive office, and as a member of the Privy Council, which latter body by a legal fiction is the constitutional advisory

council of the king. The Premier now has, however, a definite precedence allotted to him. The C. or Ministry (the terms being almost synonymous) is called into existence by the sovereign, generally taking the advice of the outgoing Premier as to who shall be sent for and asked to form the new ministry. In practice the sovereign's choice is really limited to some two or three names at most, for political usage has estab. the claim of the leader of the dominating party or coalition of parties to be sent for by the monarch. According to Bagehot, if any one else were sent for it would be his duty to press the claims of the true leader, and he cites the case of Lord Granville being invited in the first place to form a new ministry instead of Mr. Gladstone. The new premier then chooses his fellow C. ministers, but, till recently, custom did not permit him to exclude ex-ministers belonging to his party. In theory all members of the C. should defer to the Premier, and if they differ on a vital question of principle, they ought to resign. Differences of opinion when publicly manifested bring the C. to an end, because by the conventions of the constitution all the members of the C. are jointly and severally responsible for all its measures. A definite split in the C. makes it incumbent on the Premier, after endeavouring to bring his colleagues into agreement, to seek as a last resource an interview with the king.

The relations of the king and the C. are such that the king is constitutionally obliged to take the C.'s advice, lend it his moral and social support, and dismiss any high gov. official who opposes its wishes. The C. is bound, as is each individual member, to inform the king on all important measures of the executive, but the Premier has the exclusive right to approach the sovereign personally on all important matters of state. Other ministers, however, have a right to discuss with the king matters merely departmental.

The phrase 'ministerial responsibility,' which is intimately bound up in treatises on the constitution with the nature and functions of the C., and which, in its strict sense, denotes the legal responsibility of every minister for every act of the Crown in which he takes part, is a convention resulting from the theory that 'the king can do no wrong,' and from the refusal of the courts to recognise any act as done by the Crown which is not done in a particular form—a form in general involving the affixing of a particular seal or the counter-signature of a minister (Dicey). Ministerial responsibility in the sense that ministers are liable to lose office if they are unable to retain the confidence of the House of Commons is a theory depending on the conventions of the constitution, with which the law has no direct concern.

No C. can take or retain office without a working majority, though it is difficult to state precisely what would constitute such a majority. A modern C. would not retain power for a week if a vote of cen-

sure were passed by a newly elected House of Commons. The king can, if he chooses, dismiss the C., but such conduct, though legal, would generally be unconstitutional. To dismiss a C. which commanded the confidence of the House of Commons for the time being would only be justified by the return of a majority for the opposite party at the ensuing election.

The C. is a wholly secret body. Its meetings are in theory and in reality secret. Nor is any non-member allowed to be present at its sittings, except on rare occasions, when some departmental official is summoned to give special information. Since the First World War there has been estab. a secretariat, with secretary and assistant secretary, the former official holding also the office of clerk to the Privy Council. Disclosures of C. decisions are made only with the permission of the sovereign, such permission in practice being obtained through the intervention of the Premier. The result of the evolution of the powers of the C. Council is that that body is *de facto* the gov. of Great Britain, the king being but the visible symbol of power. It is true that it is necessary to consult the sovereign before any definite step is taken, even though that step is in the direction of legislation. But practically all the powers by law vested in the sovereign are in practice exercised by the members of the C. Whatever in legal theory the Brit. polity may be, this in reality is the form of the active governing machinery of the Brit. Constitution.

While the foregoing is the generally accepted view of the position and functions of the C., it is to be observed that Bagehot, in *The English Constitution*, acutely defines the C. as a combining committee—a hyphen which fastens the legislative part to the executive part of the State; that while in its origin it belongs to the one, in its functions it belongs to the other; and that though it is a committee of the legislative assembly, it is a committee which can actually dissolve the Parliament which appointed it, and appeal if it chooses to the next Parliament. His theory is a refutation of the dogma that in our polity the legislative and executive powers are entrusted to separate sets of persons, each independent of the other, and asserts that the peculiar excellence of the Eng. Constitution is the practical fusion of the executive and legislative powers through the C. In comparing the C. with the presidential system of the U.S.A., in which latter system the legislative and executive powers are independent of each other, Bagehot comes to the conclusion that the C. system is superior in that it facilitates administration, obviates the disadvantage of making the people the real executive-choosing body, eliminates corruption, and gets rid of the antagonism between the legislature and the executive which, springing from the fact that the House of Representatives is elected by one process and the president of another, ends in the impairment of each. The delicate relations of the C. to the Crown on the one hand and to the

Houses of Parliament and the people on the other, as well as the internal relations of its members to each other and to the premier, are clearly expressed by Gladstone in *Gleanings of Past Years* thus: 'The association of the Ministers with the Parliament and through the House of Commons with the people is the counterpart of their association with the Crown and the prerogative. The decisions they take are taken under the competing pressure of a bias this way and a bias that way, and strictly represent what is termed in mechanics the composition of forces.' Such a description could not be applied to a presidential system like that of the U.S.A., where the president is elected for a fixed term. Dicey, however, justly doubts whether the Eng. Constitution may not be undergoing an insensible change due to the increasing authority of the electorate. He believes a general election may in effect be a popular election of a particular statesman to the premiership, and that the time may come when, though all the forms of the constitution remain unchanged, an Eng. Prime Minister will be as truly elected to office by a popular vote as is the Amer. president.

In substance, the C. is the directing body of the national policy, or at least until very recent times it has been generally so believed. On the other hand it might appear to-day that a party caucus is the real directing power behind the C., a position that might be difficult to sustain. The main functions of the C. were set out in the report of the Machinery of Gov. Committee (C. 9230 of 1918) as: (a) the final determination of the policy to be submitted to Parliament; (b) the supreme control of the national executive in accordance with the policy prescribed by Parliament; and (c) the continuous co-ordination and delimitation of the authorities of the sev. depts. of State. Rightly this statement draws no distinction between legislation and administration. In the modern State, most legislation, indeed, is directed towards the creation or modification of administrative powers. The C. is a general controlling body. Many of its members are departmental ministers. It neither desires nor is it able to deal with the multiple details of gov. It expects a minister to take all decisions which are not of real political importance. Certain matters are conventionally regarded as being outside the C.'s competence. Lord Oxford and Asquith said that, speaking generally, the exercise of the prerogative of mercy, the personnel of the C., and the making of appointments, are not discussed in the C. But the question of the reprieve of Sir Roger Casement in 1916 was brought before the C., though normally the prerogative is left to the home secretary. Again the personnel of the C. has often been discussed by the C. In the past, though usually in exceptional circumstances. Another matter which is seldom discussed in C. is the conferment of honours. Yet another, which to-day is never discussed in C., is the exercise of

the prerogative of dissolving Parliament. This is, however, a recent development, and if the Prime Minister wants the advice of the C. there is nothing to prevent him from raising the question. Until 1916 there was no C. office and no secretary, and there were, therefore, no formal agenda. This unbusinesslike system completely broke down under the stress of war. One of the first acts of Lloyd George was to set up a C. secretariat to organise the business of the War C. This secretariat was the secretariat of the committee of Imperial Defence. On the formation of the War C. in 1916 Lloyd George attached the war committee's secretariat to the C. Thus, the secretariat of the committee of Imperial Defence became the secretariat of the C. The C. secretariat and the secretariat of the committee of Imperial Defence are now administratively distinct, though there are important elements of contact. The C. takes decisions by a majority whenever it cannot reach an agreed solution. It seems that the practice of taking votes and deciding by a majority did not originate until 1880. The decision to arrest Dillon in 1881 was carried by Gladstone's casting vote. The question of the removal of the duke of Wellington's statue from Hyde Park Corner in 1883 was decided by a show of hands. In any case, the taking of votes is exceptional. It is said that on the Education Bill in 1901 the C. divided sev. times, a practice which, according to Fitzroy (*Memoirs*), large Cs. have rendered unavoidable. The C. itself is a committee, and it reaches its conclusions in much the same way as other committees—discusses a subject from various aspects until some compromise emerges. A minister who resigns from the C. usually desires to make an explanation in Parliament, and since this involves an explanation of C. discussions, he must get the king's consent. For this purpose he asks permission through the Prime Minister. But this rule is not always obeyed, and generally speaking it is difficult to prevent revelations of C. discussions when they are matters of political controversy, nor is the press left entirely without guidance through the usual 'understood' formula. The taking of notes by any minister other than the Prime Minister was for long forbidden. Since 1916, however, there have been formal C. minutes. Unless the C. otherwise directs, the secretary to the C. or his deputy is present at every C. meeting. He takes no part in the discussion unless his opinion is asked on a particular point (such as a point of procedure), but merely makes a note of the C.'s decisions. This note is known officially as the C. 'conclusions,' though more popularly as the C. 'minutes.' The C. secretariat is not in any sense an advisory body. It does not make recommendations. It does not interfere with departmental responsibility. As to C. solidarity or collective responsibility, the precedents are unconvincing. 'It may be said, first, that the Prime Minister is frequently in a position to pledge his

colleagues' support, because the only alternative is his own resignation. Secondly, a minister should not announce a new policy without C. consent; but, if he does, the C. must either support him or accept his resignation. Thirdly, a minister ought to be chary about expressing personal opinions about future policy except after consultation; and if the circumstances are such as to pledge the gov., the Prime Minister has a real cause for complaint. Any statement in advance of a C. decision is dangerous to the stability of the gov.' (W. Ivor Jennings, *Cabinet Government*, 1936).

One of the most notable changes produced by the First World War was the creation of the Imperial War C., which first met in 1917, under the presidency of Lloyd George, the Brit. Prime Minister. It consisted of the members of the Brit. War C. sitting with the representatives of the dominions and India who were attending the Imperial Conference of 1917. While the Imperial War C. was in session the overseas members had access to all the information at the disposal of the home gov. and had a status of absolute equality with the members of the War C. of Great Britain. The Imperial War C. sat during the whole period of the Imperial Conference of 1917, and in 1918 it was in session from June to Aug. At the conclusion of this session it was announced that, in view of the success of the experiment, the Prime Ministers of the dominions should, in future, have the right, whenever they deemed fit, to communicate on matters of C. importance direct with the Prime Minister of the United Kingdom. Although the dominions were fully consulted by the home gov. in all the peace negotiations, the termination of hostilities saw an end to the Imperial War C. as such.

The War C. of the United Kingdom had, of course, no formal existence. In the early days of the war it was felt strongly that the normal C. of twenty-one or twenty-two members was ill adapted to the requirements of war, when speedy decisions are often necessary. Even in normal times there is a kind of inner C., of five or six of the prin., or strongest, ministers who really formulate policy. When under the stress of war the Coalition Gov. came into being, it naturally followed that the leaders of the constituent parties were stronger than others of the ministers, and were more frequently consulted by the Premier. As these others were content to leave matters in safe hands, the War C. was gradually evolved. As in the case of the Imperial War C., this war creation died a natural death on the cessation of hostilities. On the outbreak of the Second World War in 1939 a War C. of nine members was formed, consisting of the Prime Minister, chancellor of the exchequer, secretary of state for foreign affairs, minister for co-ordination of defence, first lord of the admiralty, secretary of state for war, secretary of state for air, lord privy seal, and minister without portfolio. The C. secre-

tariat previously referred to, also a product of the war days, still survives. See also succeeding article.

The Cabinet in the United States.—The development of the C. in the U.S.A. took quite a different turn from that of Great Britain which has served as the model for most of the European countries. In Great Britain the Prime Minister is the chosen leader of the political party which has the largest representation in the House of Commons, and his colleagues in the C. usually belong to the same political faith, and have to be members either of the Commons or of the Lords. In the U.S.A. the C. is named by the President. It consists of the heads of the great governmental depts., and serves as his advisor. It meets with him every week and discusses questions of policy, the President's being the final word. C. ministers are not members of the Amer. Congress. In fact, if a congressman or senator is named to a C. post, he resigns his position in the Congress. It is the usual thing for the President, when he is sworn into office on inauguration day, to transmit to the U.S. Senate his list of C. officers. These have to be confirmed by a majority vote of the Senate, and this is usually done as a matter of course.

Again, in the Brit. Gov. C. ministers, being members of Parliament, sit in the sessions of the House to which they belong, submit to questions by members, and take an active part in the debates, particularly in matters affecting their respective depts. No Amer. C. minister has the right to take part in Congressional debates. He can be asked for information by a congressman or senator by letter, or personal interview, or he can be summoned before a Congressional committee and asked questions. But even then he can refuse if the answer is deemed 'incompatible with the public interest.'

The Amer. C., as to size, is a matter of gradual growth corresponding to the increase in power, wealth, and business of the country. Under George Washington, the first President, it consisted of the secretary of state (corresponding to the minister of foreign affairs in Great Britain); secretary of the treasury, secretary of war, attorney-general, and postmaster-general. Under President John Adams, the second chief executive, the C. was increased by a secretary of the navy in 1798. Under President Taylor in 1849 there was added a secretary of the interior. In 1889 under President Grover Cleveland the farming interests of the country were considered so important that a secretary of agriculture was named. Under President Theodore Roosevelt in 1903 the new post of secretary of commerce and labour was created; but under President Woodrow Wilson in 1913 their duties were separated, and he named a secretary of commerce and a secretary of labour. Each new C. post is authorised by an Act of Congress (see under ACT). The position of secretary of state is considered the greatest post within the President's gift, although the salary is the same as that of the other C. ministers.

He not only handles foreign affairs, but is also the medium of correspondence between the President and the governors of the various states in the union; has the custody of the great seal of the U.S.A. and countersigns and affixes such seal to all executive proclamations, and is the custodian of the treaties made with foreign nations and of the laws of the U.S.A.

There is also this notable difference from the Brit. C. system; in Great Britain, Premier and C. ministers only hold their posts so long as they have command of the House of Commons. In the U.S.A., just as the President is immovable for the four-year term for which he is elected (unless impeached and removed), so are his C. ministers unless he asks them to resign. Thus it has often happened in the hist. of the U.S.A. that the majority in one or both houses of Congress belonged to one political party, while the President and his C. belonged to another.

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Cabinet, Imperial War. The I. W. C. was instituted in 1917 for the purpose of giving dominion statesmen a direct, continuous, and effective share in the decisions taken by the Brit. Gov. on questions relating to the foreign policy of the empire as a whole. The Premiers and other leading ministers of the dominions were convened with Brit. ministers on a footing of absolute equality, in a Cabinet which not only discussed but decided the main questions of the conduct of the war, both military and diplomatic. Prior to 1917 arrangements had been made through Imperial conferences to bring dominion statesmen into consultation with the Brit. Gov., but constitutionally speaking, this position was not satisfactory, for the reason that the dominion representatives had no direct share in the decisions taken. In 1918 it was decided, with a view to the War Cabinet meeting continuously, that dominion ministers should be appointed to reside permanently in London as members of the Cabinet. Meantime the dominion premiers were to continue to be *ex officio* members of the Cabinet and, when unable to attend personally, communicated directly with the Brit. premier on Cabinet matters. Thus at last the "equal nationhood," to use Sir Robert

Borden's phrase, of the dominions and the United Kingdom within the empire came to be recognised. But the system, if better than the old arrangement of conferences, was faulty in that the Imperial Gov. was not a gov. in the constitutional sense; it did not possess the unity and coherence of a gov. answerable to a single Parliament and electorate; its members were responsible to six different parliaments and electorates and might, obviously, be individually removed and replaced at different times and for different reasons as a consequence of political changes either in the United Kingdom or in the dominions which might conceivably have no sort of bearing on the imperial questions falling within the purview of the Imperial Cabinet. On the outbreak of the Second World War, in Sept. 1939, no arrangements were made for including dominion ministers in the War Cabinet. After two months, however, one minister from each of the four dominions (Canada, Australia, New Zealand, and the Union of S. Africa) came to London for a brief stay in order to co-ordinate the war efforts of the dominions with that of the United Kingdom. But they did not become members of the War Cabinet and, indeed, it may be observed that the development in the dominions in the previous twenty years of an ever more independent outlook on foreign affairs has probably precluded the likelihood of the experiment of 1917-18 being repeated. Whether the solidarity and unity of the Empire or Commonwealth in foreign policy, or whether the efficacy of the conjoint or co-ordinated war effort would be prejudiced by the omission to form an I. W. C., may be very much doubted; for experience in the Second World War showed that the conventional system of frequent consultation by an exchange of visits, coupled with the appointment of high commissioners in the United Kingdom and in the dominions, effected the same purposes and the war found the empire fully united on its policy (Eire alone remaining neutral).

Cabinet Noir, special secret dept. of the postal service, in which letters may be opened and read, then resealed and sent on. This system was first organised in France under Louis XIV., and was destroyed with all systems of the same nature at the revolution. It was again estab. under Napoleon, but was given up on the formation of the republic.

Cabiri (Cabeiri), The, group of mystic deities in Gk. mythology who have been variously identified with Demeter, Persephone, and Rhea; with the Dioscuri; and with Dionysus and Hermes.

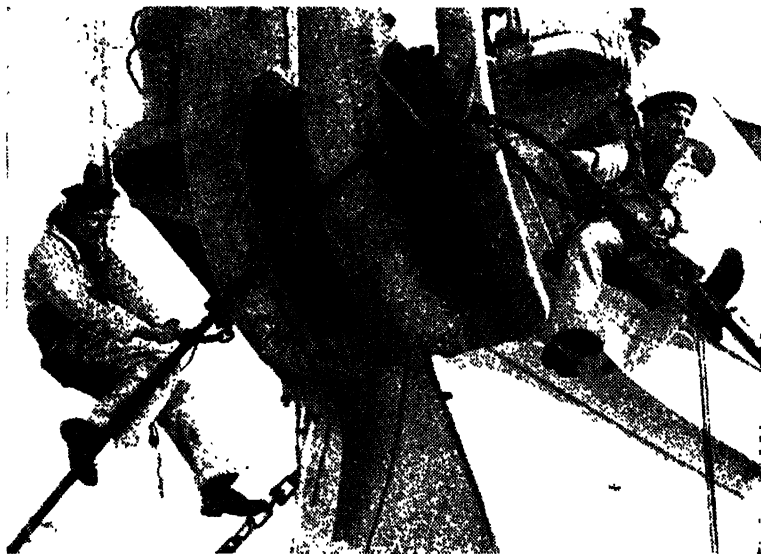
Cable, large rope or iron chain used on ships to hold the anchor. CAs. are made of hemp or jute, of galvanised or zinc wire, and of chain. Rope CAs. vary from 3 to 25 in. in circumference. Hemp and wire ropes are used for towing and mooring purposes, whereas chain ropes are used on steamships, where they can be moved and manipulated by steam engines. Steam CAs. are made in links in 12½-fathom lengths.

In the mercantile service the chains are made to 15-fathom lengths.

Submarine Cables.—A submarine telegraph C. consists of a central stranded copper conductor covered by sev. layers of insulating material such as gutta percha, parra gutta, or polythene. A comparatively weak electric current is employed for transmission, because the preservation of the C. from both internal and external injury is necessarily of the first importance, a weak current not being liable to

and Japan. The last Brit.-owned C. laid was the long-projected Pacific C. connecting Vancouver with Australia, which was completed in the opening years of the present century.

As regards make, the principles underlying the design and manuf. of Cs. had by the beginning of the twentieth century become so well estab. that the recent years have witnessed but little alteration, except in the direction of improvements effected in materials and in the application of



Postmaster-General

REPAIR WORK BY A BRITISH POST OFFICE CABLE SHIP

The cable has been hooked up from the sea-bed by the grapple.

eat the wires so as to injure the insulating material. Furthermore, the receiving instrument must be so sensitive that it can be operated by the weak current, hence neither the sounder nor ordinary register, which need much stronger currents, can be used.

Up to comparatively recent years Britain enjoyed a monopoly in respect of Cs., but later both France and Germany made some progress towards rendering themselves independent of the Brit. Cs. Both these countries have for many years past been linked with America by Cs. owned by themselves, though the manuf. and laying of those Cs. were effected by a Brit. company.

The spread of the C. system has naturally followed the trade routes, and hence their trend has, apart from the C. to America, been eastward as far as Australia

more rigorous tests. As protection against submarine animals (e.g. terebro worm), the core has been protected with a thin layer of brass tape, while to secure the detection of masked faults after submergence some manufacturers have adopted the practice of subjecting the core to a hydraulic pressure of 4 tons to the sq. in. and an electric pressure of 5000 volts from an alternating current transformer. Finally, it is to be observed that the open type of sheathing adopted in the early Atlantic C. has been abandoned, the deep sea portion now being sheathed with tempered galvanised steel wires, offering a breaking strain of over 80 tons per sq. in. It is difficult to estimate the life of a C., so much depending on the nature of the seabed, but the limit may be placed at up to fifty years. See C. Bright, *Submarine Telegraphy*, 1898, *Story of the Atlantic*

Cable, 1903, and Life of Sir Charles Tilton Bright, 1908; C. Baines, Submarine Cables, Testing and Working, 1932; S. Garham and R. Haddfield, Submarine Cable, 1934.

Cable, George Washington (1844-1925), Amer. author, was b. at New Orleans, Oct. 12, his father being of an old Virginian family, and his mother a New Englander. He became a clerk at the age of fourteen, entered the 4th Mississippi Cavalry of the Confederate Army in 1863, and at the close of the war (in which he narrowly escaped death) began his journalistic career in his native city. His *Old Creole Days*, which is a series of sketches of the old Fr.-Amer. life of New Orleans, first appeared in *Scribner's Monthly*, and served to introduce to the public a writer peculiarly gifted with descriptive powers and with a sympathetic insight into both the humorous and pathetic sides of life. His first novel, *The Grandissimes* (1880), gives an accurate picture of Creole life in Louisiana a century ago. *The Creoles of Louisiana* (1884) was a hist. of the people, and roused considerable indignation among the Creoles themselves. In his *Dr. Sevier* (1883), which is probably his finest work of fiction, he reproduced with remarkable success the gentle Fr.-Eng. dialect of Louisiana. Life in the marshy lowlands at the mouth of the Mississippi is faithfully depicted in his short stories, *Belles Demeiselles Plantation*. Other books are *Bonaventure* (1885), *The Cavalier* (1901), and *Kincaid's Battery* (1908). For some time also he ed. *Current Literature*, a New York monthly. In literature C. suggested fresh and higher ideals for the historic novel. He d. at St. Petersburg, Florida.

Cable Ducts, see under SUBWAY.

Cable Ways, in civil engineering, overhead cables, used for the transport of goods, though also used in some mt. dists. for passenger traffic. Also called aerial ropeways. The cable and hauling gear are carried on trestles, which may be erected on irregular ground or carried over streams and ravines. The C. W. system has been developed in recent years owing to the increased use of electrical power for industrial purposes. Thus, at the Penmaenawr quarries, in Wales, where quarrying is carried on at heights up to 1500 ft. above sea level, this system of transport of materials is of the greatest use.

Cabot, John (Caboto, Giovanni) (1450-1498), discoverer of N. America, was a Genoese who became a naturalised Venetian and finally settled as a merchant in Bristol. News having reached England that Columbus had discovered a vast new ter., C., in 1497, set out in the *Mathew*, and after fifty-two days' sail landed on Cape Breton Is., where he planted the royal flag. His name is associated with the earliest attempts to reach India by the N.W. Passage; in 1496 Henry VII. granted letters patent to C. and his sons to fit out ships for the exploration of that route. C. and his sons failed, but they discovered Newfoundland and sailed along the coast of Labrador to Virginia. This was C.'s second voyage of discovery

and was begun at some date between 1497 and 1498. He had heard from João Fernandes about Greenland, and thinking it part of the Asiatic continent made his way in that direction. But once more, though he explored E. and W. the coasts of Greenland, reached Baffin Land and lighted on Newfoundland and Nova Scotia, he was obliged at length to return home, baffled in his search for Cipangu, or Japan, which was to have been the open door through which England passed to reach spices and the fine merchandise of the E. To C. must be credited the discovery of Newfoundland and other fisheries.

Cabot, Sebastian (c. 1474-1557), navigator and cartographer, son of John C.; probably b. at Venice, but the place and date of his birth are alike uncertain. He has often been confused with his father; it appears more likely that it was John who undertook the voyage to the N.W. Passage about 1496-98, although his son may have accompanied him. In 1512 Sebastian won a reputation in England as a cartographer. He appears to have prepared maps of Gascony and Guienne for Henry VIII., and later in the same year to have been commissioned by Ferdinand V. of Spain for a similar purpose. On the death of Ferdinand in 1516, C. abandoned his projected voyage to the N.W. and returned to England in the following year. He again entered the service of Henry, and on his behalf set sail from Bristol on a voyage of discovery to Hudson Bay and Hudson Strait. (Doubts have been raised as to whether this voyage ever took place.) In 1519 C. was appointed pilot-major by the Sp. king, Charles V. In 1526, after a dispute between Spain and Portugal regarding their respective trading rights with the Moluccas, C. was sent out by Charles V. to explore the coast-line of Brazil. He entered the R. La Plata and sailed up its trib., the Paraguay, but his attempt to make colonies was a failure. Consequently, on his return in 1530, he was imprisoned for a year and exiled to Oran in Africa for two years. He was subsequently restored to his former post of pilot-major, but in 1517 resigned, and soon after was welcomed in England by Edward VI. C. was chiefly instrumental in promoting and directing the Company of Merchant Adventurers (1553), which opened up Brit. trade with Russia. He was appointed governor to this company and inspector of the Eng. Navy (1547). C.'s map, showing the discoveries of himself and his father, can be seen in the Bibliothèque Nationale. See C. R. Beazley, *John and Sebastian Cabot, 1498*; H. P. Biggar, *The Voyages of the Cabots and Corle-Reals to North America, 1503*.

Cabourg, Fr. vil. in Normandy, in the dept. of Calvados on the Dives, 11 m. distant from Trouville. It is a favourite watering-place on account of the excellent sea-bathing and the good sands. Amongst other attractions there is a fine casino. Pop. 2000.

Cabra, tn. 28 m. S.E. by S. of Cordova

on the Jaen-Málaga railway, in the prov. of Cordova, S. Spain. Its old castle and mosques, converted into churches, are interesting remains of the Moorish settlement. Pop. 14,000.

Cabral, Pedro Alvares (1460-1526), Portuguese navigator, who was sent in 1499 by the king of Portugal to establish a factory on the Malabar coast in India, and to win the friendship of the rajah of Calicut. C. took a westerly course, landed on the coast of Brazil, and took possession of part of the neighbouring country. He sent one of his ships back to Portugal to announce his discovery, and with his other ships he set sail for India. During the voyage four of his vessels were lost, and among those who perished was Diaz. C. reached Calicut, and after several encounters with the natives established a factory there. He continued to explore the Malabar coast, and returned to Portugal in 1501 with rich cargoes.

Cabrera, anct. Capraria, small is. of the Balearic group in the Mediterranean Sea. Goats are numerous, and fishing is an important industry. After the capitulation of Baylen in 1808, many Fr. prisoners were sent to C., where they were cruelly treated.

Cabrera, Ramón (1806-77), Carlist leader, was educated for the Church, but on the death of Ferdinand he instantly joined in the civil strife which broke out, as a staunch ally of the pretender Don Carlos, who was supported by the absolutist party. During the war which followed he distinguished himself no less by his cruelty than by his bravery. It is said that he shot 100 officers and 1100 prisoners of war to avenge the murder of his mother. In 1839 Don Carlos rewarded him with the governor-generalship of Valencia, Murcia, and Aragon. Driven across the frontier to France in 1840, he was indignant when in 1848 his leader abdicated his rights. After a futile campaign in the absolutist cause he returned to France. In 1875 he issued a manifesto counselling the rebels to submit to the restored monarchy of Alfonso XII. His marriage with a rich Eng. wife and his absence from his native land were the causes of this signal act of disloyalty.

Cabriole, word applied to the legs of tables, chairs, or other pieces of furniture, shaped as the legs of a goat, with knee and cloven foot, or merely having a double curve. The fashion was introduced in France in the seventeenth century; and it was prevalent in England from the close of that century until the reign of George II. The term is also applied to chairs with stuffed shield or oval backs by Heppelwhite.

Cabul, see KABUL.

Cabuyas (formerly Tabuco), tn. on the is. of Luzon, in the Philippines, situated near the lake of Bay. The cultivation of rice is carried on. Pop. 9500.

Cacao, see COCOA.

Caccamo, tn. in the prov. of Palermo, Sicily. It lies 22 m. S.E. by E. of that city. Precious stones, such as agate, beryl, and jasper are mined in the neighbourhood. Pop. 10,300.

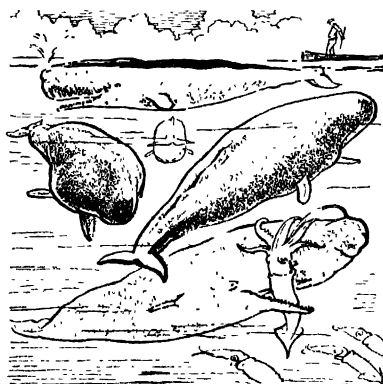
Caccia, Guglielmo (1568-1625), Piedmontese painter, called 'Il Moncalvo' from his long residence there. Probably a pupil of Soleri. He painted in fresco and oil; his manner partakes more of the Rom. than the Bolognese school, but he has something of the energy of the Carracci. The church of Sant' Antonio Abbate, Milan, has frescoes of his; another work in fresco is the cupola of San Paolo at Novara. His works were known and prized in many It. cities. The Chiesa de' Conventuali at Moncalvo has a regular gallery of his pictures. Among his best oil-paintings are 'St. Peter' and 'St. Theresa,' in Turin; the 'Taking down from the Cross,' at Novara; 'Raising of Lazarus' and 'Miracle of the Loaves,' at Chieri. Two of his daughters were painters.

Caccini, Giulio (c. 1546-c. 1615), called Giulio Romano, It. musician, was b. at Rome and studied under Scipione della Palla. About 1565 he went to Florence, where he remained as singer to the Tuscan court till his death. To him are due those first attempts at dramatic music which culminated in the opera. His most famous of these are *Il combattimento d'Apolline col serpente* (1590), where the libretto is by Bardi; *La Dafne* (1594), and *Eurydice* (1600), opera by Rinuccini. It is said that Jacopo Peri, the Florentine musician (1561-1633), produced the world's first regular operas. These were *Daphne* (or *La Dafne*), now lost, but which is said to have included some of C.'s music, and *Eurydice* (1600). Another important production was the *Nuove Musiche* (1602), a collection of songs and madrigals, with instructions in the art of singing.

Caceres, prov. and tn. of Spain in Estremadura. Belongs to the Tagus basin, in a rich agric. dist. It is noted for bacon; exports wool, red sausages (*embutidos*), and olives, and manufs. leather and cork goods. Also produces phosphates. The prov. contains two bishoprics—Coria and Plasencia. Pop. (1944) 535,000. The tn. was founded c. 74 B.C., and taken from Moors, 1225. It is on a branch line meeting the more northerly of the two Madrid-Lisbon railways at Arroyo. It had an old Jesuit college, later turned into a hospital. There are numerous remains of Rom. buildings and there are mediaeval palaces in the Old Tn. Pop. (1944) 30,000.

Cachalot, or **Sperm Whale** (*Physeter macrocephalus*), the only representative of its genus, is a huge toothed whale, measuring as much as 60 ft. in length. It is found in all tropical and subtropical seas, being usually met with in a herd or 'school,' consisting often of some hundreds. The bulk of head, which takes up a third of its body, is made up of tough fat or 'junk,' round which is a great 'case.' The refined oil from this case yields spermaceti. This substance is still used in ointments, and twelve barrels can be obtained from one fish. Verging to the left, at the anterior extremity of the head, is the blow-hole, whilst the mouth, which is some way behind the end of the snout,

is ventral. Excellent ivory in small quantities may be obtained from the teeth (about twenty-two in number), which line each side of the lower jaw. This jaw, which is very narrow, may be let down so as to make an enormous gape. The throat is said to be wide enough to allow the whale to swallow a man, and it is thought to be this species which swallowed Jonah. The head is very massive, high and truncated in front; the flipper is short and broad, and the dorsal fin merely a low protuberance. In colour it is black above and grey beneath. Sperm whales feed chiefly on squid and cuttlefish and are rarely seen in European waters.



CACHALOTS

Ambergris, which is used in perfumes, is an intestinal secretion of this species; it is often found on the sea.

Cachar, dist. of Pakistan in Assam, connected politically with C. Hills tract. It borders on Manipur. Area over 2000 sq. m. The C. valley is narrow, with many long minor valleys from the Lushai hills. It produces tea for export, also rice and cotton, and sends timber to Bengal. Pop. 500,000.

Cache (Fr., a hiding-place) is a word used in Canada and W. U.S.A. for a hole dug in the earth to conceal food and other things too heavy to carry.

Cachet, *Lettres de*, see *LETTRES DE CACHET*.

Cachexia (Gk. for an evil condition) is a term used in medicine to express a thoroughly unhealthy condition of the body, such as that occasioned by insufficient feeding and above all by chronic maladies. Doctors thus speak of lead C. (resulting from lead-poisoning), gouty and cancerous C.

Cachoeira (waterfall), city of Brazil, in the state of Bahia, 60 m. N.W. of Bahia, on the R. Paraguassu. It has a considerable export trade in coffee, sugar, and tobacco. Pop. 78,000.

Cachoeira da Itapemirim, tn. in the

Brazilian state of Espírito Santo on the Leopoldina railway. Grows coffee and exports timber. Pop. 65,000 (many Gers.).

Cacholong is a beautiful mineral, looked upon as a variety of semi-opal. Usually it is milk-white in colour, but it sometimes has pale red and yellow tints. It is porous, and has a lustre rather like that of mother-of-pearl, whence it is often called pearl opal. The word is likely to be of Tartar origin, but it is popularly supposed to have been named after the R. Cach in Bokhara.

Cachucha, Sp. dance of an oriental nature, of pronounced national character, written in 3-4 time. The dancer holds castanets, and the dance, which is graceful and voluptuous, gradually increases in speed. The head and shoulders play an important part.

Cacique, or **Cazique**, title equivalent to lord or prince, borne by native chiefs of Mexico, Peru, Haiti, Cuba, and the W. of S. America at the time of Sp. exploration. More recently the title has been given to chiefs of independent Indian tribes. It is the title given to Arawak chiefs in the W. Indies in the accounts of the journeys of Columbus by Bernaldez and Peter Martyr.

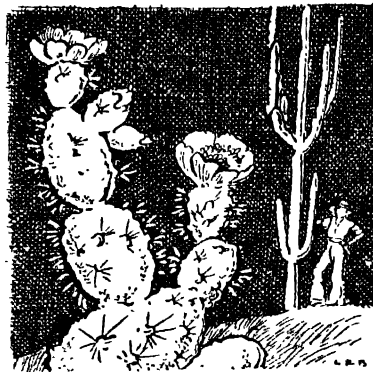
Cacodæmon, see *DEMONOLOGY*.

Cacodyl ($As_2(CH_3)_4$), or tetramethyl diarsine, is a colourless liquid boiling at $170^\circ C$. It is very poisonous, and its smell is so offensive that it was named by Berzelius from a Gk. word meaning stinking, a trace of the vapour in a room being sufficient to render it intolerable. It is derived from a product known as 'Cadet's fuming liquid,' first formed by Cadet in 1760 by distilling white arsenic and potassium acetate. This liquid is fuming and spontaneously inflammable, consisting among other things of C. oxide and a little C., the latter causing the spontaneous combustion. This liquid is distilled with hydrochloric acid and corrosive sublimate and C. chloride is produced, whence C. is obtained by heating with zinc. The true nature of C. and its derivatives was discovered by Bunsen in a prolonged research about 1840. In chemical action it acts like an electrically positive element, forming an oxide, chloride, iodide, and cyanide. An acid called cacodylic acid is formed when the oxide is acted upon by mercuric oxide, and the salts are sometimes used for skin diseases. C. cyanide is a colourless liquid obtained by distilling the oxide with mercury cyanide. The operation must be performed with extraordinary care in the open air, since the volatile vapour is among the most poisonous substances known.

Cacongo, small dist. of W. Africa, to the N. of the mouth of the Congo, between Kullu and Chilongo. It now forms part of the Congo Free State and Fr. Congo, and its name has fallen into disuse.

Cactus, prickly exogenous plants, varying in form and size, and often of abnormal shape, which with few exceptions are natives of Mexico, S. America, and California. They are grouped together in the natural order *Cactaceæ*, which comprises some twenty-five genera. The

number of species of *C.* approaches approximately to 1000. They are very curious both in structure and growth. They are specially suited to desert wastes and dry arid hillsides. They have thick juicy stems which hold large quantities of water, and as only a very small part of the surface of the whole plant is exposed, in addition to which it is completely covered by a thick skin, transpiration and evaporation are reduced to a minimum. Sometimes there is only the one thick cylindrical prickly stem, in other



CACTI

specimens the plant also bears fleshy leaf-like appendages, also covered with spines or prickles, and forming a very extraordinary-looking member of the vegetable kingdom. The spines are modified leaves. The stems are fitted with wholesome though insipid fluid and, occurring as they do in situations where ordinary vegetation could not exist, they may be regarded as one of the means which nature has provided for the benefit of men and beasts where other means of subsistence fail. The flowers of the *C.* are mostly very large and brilliantly coloured. The genera most familiar to horticulturists are *Mamillaria*, *Phyllocactus*, *Cereus*, *Opuntia*, *Epiphyllum*, *Echinopsis*, and *Echinocereus*.

In the cultivation of these plants the soil should consist of a mixture of fibrous loam, lime rubbish, broken bricks, and sand. A good drainage is essential when in pots. March is the best time for potting, and the soil should be rather dry and no water given for four days. They should be re-potted at intervals of two or three years. During the winter they should be kept exceedingly dry, and only watered about once a fortnight, but in summer they may be watered every four days. Cacti may be grown either from seed or by cuttings. The latter process is done by means of taking a cutting from an old plant with a sharp knife, and then

placing it in a dry place till roots have sprouted. The process of growing from seed is not a difficult one. The common prickly pear, a species of *Opuntia*, belongs to this family; a spineless variety, used as fodder, has been produced by Burbank. Many species of *Euphorbiaceæ* (spurge) are of succulent habit, and bear a superficial resemblance to Cacti, but the two families are actually not closely related. See H. M. Roan. *Cactus and other Succulent Plants*, 1948.

Cacus, son of Vulcan, the Rom. god of fire, son of Jupiter and Juno, was a notorious robber and giant. His home was in a cave on Mt. Aventine, where he stored the proceeds of his raids. Having stolen and dragged into his cave some of the cattle which Hercules had carried away from Spain, he was killed by that hero. Hercules discovered the hiding-place by the lowing of the cattle within the cave in response to the lowing of the remainder of the herd as they were passing the entrance of the cave.

Cadamosto, or **Ca' da Mosto**, **Alvise** (Luigi) **da** (1432-77), explorer, was b. at Venice. In 1455 he undertook a voyage to the Canaries, and as far as the mouth of the Gambia. In 1456 he made a voyage to Senegambia. His account of his discoveries was pub. in 1507.

Cadaverine, or pentamethylenediamine; formula $C_5H_{14}N_2$, a colourless liquid of ammoniacal odour, which occurs as a product of putrefaction in rotten meat and other foods which contain the amino-acid lysine. Also occurs to some extent in cheese. It is isolated by extracting the putrefaction mixture with alcohol and by precipitation with alcoholic mercuric chloride solution.

Cadbury, George (1839-1922), Quaker cocoa manufacturer, philanthropist, and Liberal, was b. at Edgbaston, Birmingham, son of John C., tea and coffee merchant, and cocoa maker in a small way. In the 1860's George and his elder brother Richard took over their father's cocoa and chocolate factory. They introduced into England the modern method of producing cocoa powder by extracting part of the natural oil of the raw bean, greatly extended the range and variety of confectionery chocolate, and introduced the first British-made decorated boxes. In 1879 they moved to Bournville, then outside the city. Here George carried out his experiments in housing and town planning. In 1900 the estate was made over to a trust under the Charity Commission. In 1901 George became part-owner of the *Daily News* (now the *News Chronicle*); and later he was chief proprietor of that newspaper, and for some years directed its policy. Of a public-spirited nature, C. interested himself in social questions; particularly housing, old age pensions, and the Adult-School Movement. He died at Northfield, Birmingham. See A. G. Gardiner *The Life of George Cadbury*, 1923.

Caddis Flies, family of insects allied to the dragon-fly. The grub or larva is aquatic, feeding on water plants, and living enclosed in a sheath of stick and

gravel, held together by silk. This protection is necessary, as the body is long and soft and much sought after by fish. The adult is a four-winged, air-breathing insect not unlike a dull-coloured dragonfly with a sucking proboscis instead of jaws. It feeds on the juices of plants. Its chief characteristic features are a small head, compound eyes, hemispherical in shape, three eye-spots, and few or no transversal veins; the wings are covered with hairs. Adults are particularly active at night. Eggs are laid in gelatinous masses on plants, stones, or in water. The larvæ build cases or tubes in which they live, composed of minute fragments of wood, grass, leaves, or shell. Within these sheaths the larvæ are both sheltered and protected. When the time for pupation arrives, the C. worm closes the ends of the tube with silk, or by attracting small stones. The pupa metamorphosis then begins, and at an advanced stage the pupæ burst their prisons and swim or creep about for a while before undergoing the change into aerial life. Some float on the top in their cases and then take flight. They occur chiefly in Europe, and a large percentage of species may be found in Great Britain. Some of the most noted genera in Britain are the *Phryganea*, *Umnophyllus*, *Brachycentrus*, *Apatania*, *Mollusca*, and *Setodes*. The larvæ are common in ponds and streams in spring, and are used as bait by anglers.

Cade, John (d. 1450), Eng. rebel of Irish birth, noted as leader of the Kentish rising of 1450, called Jack C.'s Rebellion. The early facts are obscure. It is supposed by some that he was banished for murder, 1449, served in the Fr. wars, and returned under the name of Aylmer, a physician. The more usual story is that, when the country was suffering from the bad government of Henry VI. and his friends, C., who was a man of substance in Kent, gave himself out to be Mortimer, the duke of York's cousin (for a different view on this see Gairdner), and captain of Kent and headed a rebel march on London. When the court demanded reasons for the insurrection, C. issued a paper, *Complaint of the Commons of Kent*, objecting to the king's favourites, excessive taxation, and general misgovernment. Protest was made that free election of knights of the shires had been hindered, and the rebels encamped on Blackheath. Another paper, *Requests by the Captain of the Great Assembly in Kent*, demanded the dismissal of certain ministers of Henry VI. The king's troops were defeated in a skirmish at Sevenoaks, the rebels pressing on to London. C. had Baron Say and Sele and Crowmer, sheriff of Kent, beheaded. Then, retiring, he was repulsed at London Bridge. Terms of peace were arranged, but C. broke open the prisons, withdrawing to Rochester. At Queenborough he was repulsed, and quarrels over booty lost him supporters. C. was finally killed at Heathfield. See J. Gairdner (editor), *Three Fifteenth-Century Chronicles*, 1880; J. Clayton, *The True Story of Jack Cade*, 1909.

Cadell (d. 1175), S. Welsh prince, son of Gruffudd, whose rule extended over part of Ceredigion and the valley of Towy. He captured the castle of Carmarthen in 1145. He went on a pilgrimage to Rome (c. 1160) and on his return became a monk in the abbey of Strata Florida, where he d.

Cadenabbia, beautiful health resort on the shores of Lake Como in Lombardy, Italy. It is surrounded by orange and citron groves. Its chief feature is the Villa Carlotta, which contains valuable works of art by Canova and Thorwaldsen. 'The Triumph of Alexander' (Thorwaldsen) is one of its priceless gems.

Cadence (Lat. *cādere*), the 'fall' or close of a musical phrase or period (often applied to last two chords). Term applies both to melodic and harmonic endings, and need not imply a fall in pitch. Cs. are like punctuation marks in the language of music. They may give an effect of finality, of mere pausing, or of questioning. The varieties are known as perfect, imperfect, and interrupted. A perfect C. must have its final chord on the tonic. If the penultimate chord is on the subdominant, the C. is called plagal; if on the dominant, authentic. The former occurs chiefly in sacred music. The harmony of the imperfect C. is often that of the perfect reversed, ending on a dominant chord preceded by the tonic (half close, incomplete like a semicolon). If any except the tonic follows the chord of the dominant, the effect is that of avoiding or postponing. This is known as *avoided*, *deceptive*, or *interrupted C.* The chord substituted for the expected tonic often gives a charming effect.

Cadency, see HIRALDRY, *Differencing*.

Cadenza, in music signifies an ornamental flourish introduced by a soloist near the close of a piece or section of a piece. Cs. were formerly improvised, and those of Handel, when playing his own organ concertos, were especially renowned; but now the C. is nearly always written by the composer or some other musician, and affords the executant an opportunity of showing his ability.

Cadereita, or **Cadereyta**, tn. of Mexico in the country of Hidalgo and state of Queretaro, 42 m. E. of the tn. of that name. There are silver mines in the dist. Pop. 4200.

Cader Idris (Chair of Idris), picturesque mt. in Merionethshire. It is composed of basalt and porphyry with beds of slag and pumice. The highest peak is 2914 ft. Length 10 m., and breadth 2 m. (See illustration, p. 98.)

Cadet (military) (Fr. from O.F. *capdet* = Lat. *caput*, with dimin. -*eti*), signifies a youth studying for the army at one of the recognised military colleges. In France any officer junior to another is a C. in respect to him. The military colleges in England are at Sandhurst and Woolwich. The latter is for those destined for the engineers and artillery, and the former for other branches of military service.

Naval Cadet signifies the lowest rank of officer in the military branch of the R.N.

Entry is made by competition. Nomination is in the hands of the Admiralty board. There is a two years' course on the training ship *Britannia*, after which they become midshipmen.

Cadet Force. The cadet movement in Great Britain was inaugurated in 1859, when a few units were formed, but a great impetus was given to it in the following year when a great patriotic wave spread over the country and brought into being the Volunteer Force. These two forces grew up side by side, the C. F. for boys and Volunteer Force for adults.

the Prince of Wales became colonel-in-chief of the force. On Nov. 1, 1930, when a Labour Gov. was in office, the grant from public funds was withdrawn and the force entirely separated from the army. Later, when the National Gov. came into office, the army connection was restored. In 1939, on the outbreak of the Second World War, there were various cadet corps for the training of officers.

Cadi, or Kadi (Arabic, judge), title of an inferior judge among Moslem nations. Possesses civil and criminal jurisdiction, his powers including infliction of the



British Railways

THE LOWER SLOPES OF CADER IDRIS AND CORRIS, MERIONETHSHIRE

The public schools were largely responsible for fathering the C. F., but the social advantages inherent in physical training, discipline, etc., soon appealed to those interested in the welfare of boys in tns., and units sprang up everywhere. The movement made an appeal to religious workers, and before the end of the century such excellent bodies as the Church Lads' Brigade made their appearance. Although most units were modelled on the infantry arm, a cadet battery with 9-pounder guns was formed at the Royal Naval School, Eltham, whilst the cadet units at Reading and Tonbridge schools specialised in field engineering. At a later date the movement spread to the dominions. In 1908 the public schools unit became the junior div. of the Officers Training Corps, and a monetary grant was made from public funds, and the units were affiliated to units of the Territorial Force. In 1914 the strength of the force was over 40,000. During the First World War the cadets performed a variety of duties at home, and the strength rose to over 120,000. In 1922

capital penalty. Originally also a theologian, as all Muslim law is based on the Koran. A court of appeal, originally presided over by the caliph, revises the judgments of the C.'s court. In Turkey he is appointed by the head of the Muslim Church and known as 'Nalb,' receiving a fixed salary. In Persia (Iran) and the Middle E. the office is more of a private nature.

Cadillac: 1. Small tn. of France, in the dept. of Gironde, situated on the R. Garonne, 16 m. S.E. of Bordeaux. Pop. 3000. 2. City of Michigan, U.S.A., E. of Lake Michigan. Pop. 9,800.

Cádiz: 1. Prov. in Andalusia, Spain, formed 1833, including commercial centres such as Jerez, San Lucar, San Fernando. Chief exports, wine, fruit, fish, olive oil, and salt. It practically supplies the world with sherry. Pop. 506,000. 2. The most beautiful of all the tns. of Spain, its white walls rise out of the sea. It is, or was, the gateway of the W., and was probably the first Phœnician settlement on the shores of the Atlantic, yet it has the appearance of the newest city in Spain.

About 1720 it was almost the exclusive *entrepôt* of trade between S. Europe and America. C. was sacked by the Eng. under the earl of Essex in 1596, but in 1625 the Eng. fleet was repulsed with heavy loss. The old cathedral was almost entirely burnt by the Eng. patriotic pirates and the new building was only begun in 1722 (completed between 1832 and 1838). It is majestic and classical. No other church merits attention except the Capuchinos, where Murillo met his death by falling from the scaffold while painting the reredos on April 3, 1682. C. is enclosed by walls and surrounded on three sides by the sea and has a fortress opposite that of Ceuta. A naval wireless station is installed at San Fernando. There is a medical and science faculty at C. in connection with the univ. of Seville. An explosion in the submarine depot on Aug. 18, 1947, caused the deaths of 500 persons, with 5000 injured, the explosion being felt 60 m. away. Hardly a house was left standing in the San Serverino and San Jose dists. It exports salt, fish, fruits, cork, wine, oil, etc., and transports coal, machines, and textiles. The pop. is 75,000.

Cadman, Charles Wakefield (b. 1881), composer, specialising in Amer. Indian music, b. Johnstown, Pennsylvania, U.S.A. Studied music in Pittsburgh, Pennsylvania, where he afterwards served as musical critic on the local papers and organist in various big churches. Later he went to Denver and finally settled at Los Angeles. He became an authority on the music of the Amer. Indians. Lillian Nordica first made him popular by performing his song, *The Land of the Sky-Blue Water*. In 1909 he visited the Omaha Indian reservation and secured gramophone records of their songs and flute pieces, thus preserving them for all time. Among his better-known compositions are *Four Indian Songs* and an Indian song-cycle, *From Wigwam and Teepee*; and a cantata for male voices, *The Vision of Sir Launfal*. His *Shanewis*, produced at the Metropolitan Opera House, New York City, in 1918 and 1919, is the first strictly Amer. opera to have lived beyond one season. His opera, *A Witch of Salem* was produced in 1926 by the Chicago Civic Opera Company. His *Thunder-Bird* suite for orchestra is based on melodies of the Blackfeet Indians.

Cadmium, metallic chemical element (symbol Cd, atomic weight 112.41, atomic number 48), discovered in 1817 by Strohmeyer in a sample of zinc oxide. It occurs as a constituent of most zinc ores and in the form of the sulphide in the mineral greenockite, found near Greenock in Scotland and in Bohemia and Pennsylvania. In the smelting of zinc ores the vapours of C. come off at an early stage, so that the metal can be extracted from the first portion of the condensed dust. C. is a tin-white metal and takes a good polish. When sublimed in a current of hydrogen it forms octohedral crystals, and when formed by electrolysis the sulphate and subliming the vapour in a vacuum it

crystallises as flat needles. It melts at 321.7°, has a boiling point of 778°, and a sp. gr. of 8.6. Wood's metal, which has a melting point of 60°, contains C. in alloy with lead, tin, and bismuth. C. is also used in electro-plating. A coating of C. is very resistant to sea-water. C. oxide, CdO, is the 'brown blaze' of zinc smelters, and is also found as a mineral. C. hydroxide, Cd(OH)₂, is formed as a white precipitate on adding potassium hydroxide to the solution of a salt of C. C. chloride is prepared by evaporating a solution of the metal or oxide in hydrochloric acid. C. iodide is obtained by dissolving the metal in hydriodic acid. C. sulphide is the mineral greenockite, and can also be produced as a yellow precipitate by passing H₂S into a cadmic solution. It is used as a pigment. C. sulphate is used medicinally in eye diseases. C. is bivalent, and the so-called cadmous salts are probably mixtures of bivalent C. compounds and the finely divided metal.

Cadmus (Κάδμος), in Apollodorus and later mythographers said to have been son of Agenor of Phœnicia, and Europa's brother. After Zeus carried Europa off C. was sent to bring her back, but failed. The oracle at Delphi bade him give up his quest, follow a cow he was to meet, and build a city where she lay down. He followed her from Phocis to Bœotia, becoming founder of Thebes, the acropolis being called the Cadmeia (Καδμεία). C. then slew a dragon, at Athena's command sowing the teeth, from which sprang armed men, Sparti (Ἐσπάρτοι, sown), who fought together till only five remained, from whom the Thebans claimed descent. C. married Harmonia, daughter of Aphrodite and Ares, and finally retired to Illyria as king. This story is compiled from local legends. Probably C. was originally a Bœotian hero. The introduction into Greece from Phœnicia or Egypt of an alphabet of sixteen letters is ascribed to him, and he was considered the inventor of useful arts and of civilisation generally.

Cadmus of Miletus, perhaps the oldest of the logographers (λόγος, word, γράφω, write), a name applied now to Gk. historiographers before Herodotus. Unless a purely mythical person, he lived about 550 B.C. A confused notice in Suidas mentions three of the name, two probably being identical with the Phœnician C. (q.v.). The writer is supposed to have written a hist. of Ionia. See G. Busolt, *Griechische Geschichte*, 1893; J. B. Bury, *The Ancient Greek Historians*, 1909 (lecture 1.).

Cadoc the Wise (Cattwg Ddoeth) (d. c. 570), noted Welsh martyr, who founded the abbey and school of Llancarvan, in Glamorganshire. According to the account in Rees's *Lives of Cambro-British Saints*, he prayed for a martyr's death, and was stabbed while at mass by a soldier the next day. Certain old proverbs and fables, *Doethineb Cattwg Ddoeth* (*Wisdom of Cadoc the Wise*) and *Damnegion Cattwg Ddoeth* (*Fables of Cadoc the Wise*) have been ascribed to him.

Cadogan, William, first Earl (1675-1726), Brit. general. It is thought that

he took part as a boy cornet at the battle of the Boyne in 1690. He fought with Marlborough as a quartermaster-general in all his great battles from 1701 to 1711, and was colonel of 'Cadogan's Horse', 1703-12. C. was sent on a diplomatic mission to the Netherlands (1707-10); appointed lieutenant of the Tower, 1709-1715; and governor of the Isle of Wight, 1716. M.P. for Woodstock, 1705 and 1714. He rose to the rank of general in 1717, and was created earl in 1718.

Cadore, Venetian com. in Italy, some 20 m. distant from Belluno, and celebrated as the bp. of Titian. During the First World War It. troops assumed the offensive in C. on Sept. 8, 1915, but found the Austrian position too strong to be forced. Pop. 4000.

Cadorna, Marshal Count Luigi (1850-1928), It. soldier, b. at Pallanza, son of Gen. Count Raffaele C., a famous soldier who fought beside Brit. and Fr. troops in the Crimean war. Early showed such high military talent that he was appointed to the general staff even before passing out of the Military Academy. He was a profound student, not merely of military subjects, but of science and topography. Promoted captain in 1875; then commanded the 10th Bersaglieri; and, in 1898, became major-general, with so good a reputation as a director of military training and as a leader in the field that in 1907 he was marked out as future chief of the staff. But it was not until 1914 that he reached this post, the appointment being of good augury for the allied cause in the world war, because his whole upbringing made C. an admirer of England and opposed to a policy of military co-operation with the Central Empires. In the conduct of the operations on the It. frontier he displayed his undoubted powers of leadership and sound strategic judgment; and if his tenure of the command was clouded by the disaster of Caporetto (*q.v.*) there is much evidence that he was the victim of circumstances, and that had the Allies followed his advice he might have been able to resist the Ger.-Austrian offensive. The fact that he was created a Marshal of Italy simultaneously with his successor, Marshal Diaz, is some indication of the esteem in which he was held by his countrymen. It is probable that C. risked too much in advancing eastward while ignoring the importance of the Trentino front. Indeed, the Austrian offensive in the ensuing year (1916) might have had the effect of compelling him to withdraw his E. armies but for Brusilov's (*q.v.*) remarkable attack on the Austrian rear (*see* RUSSIAN FRONT, FIGHTING ON THE). What is clear is that Italy was quite unprepared for war in 1914-15, her armies being ill disciplined and anti-militaristic. It has been suggested that the allied leaders, at a conference at Rome in 1917, showed an inability to appreciate the importance of the It. front, and that they declined to help C. with reinforcements. C. felt impelled to make the best of the situation by launching a series of forlorn assaults on the Isonzo, which, while weakening the

Austrian armies most appreciably, so undermined the morale of the It. troops by the protracted nature of the operations that Caporetto was the result. The Allies then made all possible sacrifices to strengthen and reorganise the It. front. C.'s command, however, came to an end, but at Versailles, where he had been transferred to the Allied Military Council, his military insight greatly impressed his colleagues. As the consequence, however, of the Caporetto inquiry, he was removed from the council and retired (Aug. 1918). All the points in his campaign and its results are brought out in his book *La Guerra alla Fronte Italiana*, which he pub. in 1921.

Cadoudal, Georges (1771-1804), distinguished leader of the Chouans, was b. near Auray, Lower Brittany. He was among the first to take up arms against the republic, and acquired great influence among the peasants. He was captured in 1794, escaped, and organised a wholly peasant army, which could never be subdued. After a period of apparent submission, he revolted again in Brittany in 1799, and was compelled to submit. Bonaparte recognised his ability, activity, and character, and endeavoured to solicit his services, but was unsuccessful. C. crossed over to England. He was made lieutenant-general by the Comte d'Artois, and in 1802 conspired to overthrow the first consul. He went to Paris with this design, but was captured and guillotined. His family was ennobled after the restoration.

Cadoxton, tn. in Glamorgan, S. Wales, 2. m. E. of Barry, whose inhab. are chiefly engaged at the docks. The church of St. Cadoc in the old vil. is amalgamated with Barry (*q.v.*). Pop. 6500.

Cadre (Fr. frame), military term which denotes the 'framework' of any regiment or corps, i.e. the permanent commissioned and non-commissioned officers, such as the drummers, subalterns, etc. Round these the rest of the regiment may be gathered, as it were.

Caduceus, name applied originally to an enchanter's wand, but afterwards also given to a herald's staff. Hermes, or Mercury, is always depicted carrying such a staff. In form it had three shoots, one of which made the handle, the other two being intertwined at the top.

Caduceus' Wand, *see* DIVINING ROD.
Cadwalader, spelt also *Cædwalla* (d. 634), king of Gwynedd, S. Wales. He invaded Northumbria in 629, and was driven to Ireland by an Anglian king, Eadwine. He defeated Eadwine at Hatfield and ravaged Northumbria. He was defeated and slain near Hexham by Oswald, nephew of Eadwine.

Cadwgan (d. 1110), Welsh prince, son of Bleddyn ap Cynvyn, king of Gwynedd. C. beat back the invasion of William Rufus in 1097, but was defeated by the earl of Shrewsbury two years later at Anglesey. He paid homage to the earl, and helped him against Henry I. in 1102, but was ultimately subdued and deposed by that king.

Cadzand, or **Kadzand**, vil. situated in Zeeland, Holland, 14 m. from Bruges, near the mouth of the R. Scheldt. Sir Walter Manny and the earl of Derby defeated the count of Flanders here in 1337.

Cæcilia (Lat. *cæcus*, blind), kind of serpent-like amphibian, of the order Apoda, about which little is known. It has a worm-like body, without tail or limbs, with transversely furrowed skin of a scaly nature. These worms inhabit warm countries and damp places, and burrow like earthworms. They are 20 in. long, with the thickness of a large worm, and are found in America, India, and Africa.

Cæcilius Statius (d. c. 168 B.C.), popular Rom. comic poet and dramatist, b. at Milan; a slave when young, he became a friend of Ennius. He is mentioned by Cicero (*De Optimo Genere Oratorum*, l.; *Ad Atticum*, vil.; *De Finibus*, ii. 7) and Horace (*Epistles*, ii. 1). Only short fragments of his works remain, chiefly in Anlus Gellius.

Cæcum (Lat., for *intestinum cæcum*, the blind gut), sac perforated at one end only, situated at the point of junction of the smaller with the larger intestine. It is not connected in man with any process, but in herbivorous animals it is probably an aid to digestion, secreting a gastric fluid. It is attached to the vermiform appendix and is subject to inflammation, a condition known as typhilitis.

Cædmon (d. c. A.D. 680), earliest Eng. Christian poet, 'father of Eng. song.' The only trustworthy information about him is in Bede's *Ecclesiastical History*, iv. He was a servant at Whitby monastery, where one night he had a vision, and a voice bade him sing 'the origin of created things.' 'Thus sang he of the creation of the world, and the beginning of the race of men, and all the history of Genesis . . . also of the terrors of the future judgment and the horrors of hell-punishment, and the sweetness of the heavenly kingdom' (Bede). C.'s *Paraphrase*, as described by Bede, was thought to be embodied in a MS. of sacred epics, now in the Bodleian Library, Oxford (titles of poems being *Genesis*, *Ereodus*, *Daniel*, *Christ*, and *Satan*), but the best critics reject them, though they are possibly by later disciples. The theme anticipates that of Milton's great epics. The hymn which C. was supposed to have composed in his dream is in Northumbrian dialect, and is preserved in a MS. of Bede's *History* now at Cambridge. A memorial cross was erected at Whitby, 1898. For the text of the poems see the trans. by B. Thorpe, *Cædmon's Metrical Paraphrase of Parts of the Holy Scriptures*, in *Anglo-Saxon*, 1832; W. H. F. Bosanquet, *The Fall of Man or Paradise Lost in Cædmon*, 1860; R. Wülker, *Bibliothek der angelsächsischen Poesie*, ii., 1894; C. W. Kennedy, *The Cædmon Poems*, 1916. Consult H. W. Longfellow, *The Poets and Poetry of Europe*, 1849; H. Morley, *English Writers*, vol. ii., 1868; S. Brooke, *English Literature to Norman Conquest* 1898; W. P. Ker, *The Dark Ages*, 1904; E. Pons,

Le Thème et le sentiment de la nature dans la poésie anglo-saxonne, 1925; G. P. Krapp, *The Junius Manuscripts*, 1931.

Cælius Antipater, Lucius, see **CELIUS**.
Cælius Aurelianus, eminent Lat. physician and medical writer, b. at Sicca in Africa (fl. end of the fourth century A.D.). He was an exponent of the 'methodic' school of medicine. He has left two valuable Lat. works (trans. from the Gr. of Soranus of Ephesus), *De Morbis Chronicis* and *De Morbis Acutis*. There are also fragments of his *Medicinales Responsiones*, a general treatise on medicine, in which his *Gynæcica* is abridged from Soranus's *Περὶ γυναικείων παθῶν* (eds. Amman, 1709; Haller, 1774; Rose, *Anecdota Græca et Latina*, ii., 1870). His writings were considered more practical than those of any other medical authority of antiquity. See Kuehn, *Programma de Cælio Aureliano*, 1816.

Cælum Sculpioris, the Sculptor's Tool, a constellation of Lacaille. It is situated below Columba Noachi and Canis Major, low enough not to rise in this country.

Caen, tn. of Normandy, Franco (Lat. *Cadomum*), cap. of dept. of Calvados. Among its pre-war manufs. were lace, crape, cotton yarn, and cutlery; it had also breweries, shipbuilding industry, and dyeworks, and, in later years, metallurgy had made C. a great tn. A maritime canal connects the port with the sea, and the railway connections are good. The port is admirably equipped for handling cargo from small tramp steamers, coasters, and landing craft. It has three basins, with extensive and well-equipped quays, and two shipbuilding yards; but the lack of a dry dock is a major handicap. Near by is the 'Prairie' with its well-known race-course, and also the celebrated subterranean stone quarries, from which comes the C. stone, so largely used in England from the eleventh century onwards. Cologne, Winchester, and Canterbury cathedrals are built of it, also Henry VII's Chapel at Westminster, and it is still much used. The tn. dates at least from the ninth century. It is on the R. Orne, about 7 m. from the Eng. Channel and 124 m. by rail from Paris. C. is in the midst of a fertile plain and, before the Second World War, had good streets, fine squares, and many noble specimens of architecture. St. Etienne Church (also known as the Abbaye aux Hommes) was founded by William the Conqueror. A monument there set up to him by William Rufus was destroyed in 1562 by the Huguenots, the church also being much damaged. It was restored early in the seventeenth century, a marble slab still marking William's former resting-place, with the inscription: 'Here is buried the unconquerable William the Conqueror, Duke of Normandy, King of England.' This fine church was only slightly damaged in the 1944 bombardments. William's wife Matilda founded La Trinité, and was buried in the choir of that church (also known as the Abbaye aux Dames), which has also survived. St. Pierre, the most beautiful church in C., stood in the chief street, rue St. Jean, but it perished in the 1944 bombardments,

together with St. Sauveur and St. Jean. C. Castle (William's anct. château), begun by the Conqueror and finished by Henry I. of England, was partly destroyed in 1793, and the rest of it was destroyed in 1944. C. contained a univ., which was founded under an Eng. regent, a museum, a fine public library, and many other public institutions, but none of their buildings remains, for the centre of C., its shops and industrial quarter, were demolished in the tremendous bombardments of June-July 1944 which came upon the tn. in two great waves, the first soon after the allied landings in Normandy, and the second on the eve of the battle that brought the inhab. their liberation. Yet nearly 30,000 inhab. remained in the tn. during the bombardment, 2000 losing their lives (see WESTERN FRONT IN SECOND WORLD WAR). There were monuments to the natives of Calvados, killed in 1870-71, and to the lawyer Demolombe, besides statues of Louis XIV., Auver, and Malherbe, but few of these survived the bombardments.

C. was finally lost to England in 1459. It was much damaged during the civil war between Protestants and Catholics. In 1685 the greater part of the lending pop., being Protestants, were forced to fly by the Revocation of the edict of Nantes. Pop. 54,000 (1939). See L'Abbé de la Rue, *Essais historiques sur la Ville de Caen*, 1820-42; E. de R. de Beaurepaire, *Caen illustré*, 1896.

Caerdydd, see CARDIFF.

Caerlaverock, in the co. of Dumfriesshire in Scotland, stands on the Solway Firth about 6 m. from Dumfries. It is famous for its ruined castle, the seat of the Maxwells. Pop. 800.

Caerleon, tn. of Monmouthshire, 2 m. from Newport, possesses the remains of the largest Rom. amphitheatre in the kingdom, with an arena of about 20,000 sq. ft. The fortress covered 50 ac. The gems of the museum include two ivory plaques and an enamelled shula. The coins found include one of the Emperor Quintillus who reigned for seventeen days. A tablet records that the barracks were rebuilt about 260. King Arthur was said to have spent five Christmases in C. In excavations in 1939, gold coins were found: Nero and Agrippina (A.D. 55), Nero (A.D. 61), Vespasian (A.D. 72), Titus (as Cæsar, A.D. 74), and Domitian (as Cæsar, A.D. 73). The site excavated, known as Myrtle Cottage Orchard, Cross Street, included a short stretch of the N.E. defences of the Rom. legionary fortress and a portion of the *prætorium* of the fortress. The defences comprised the primary clay bank and ditch, built when the second Augustan Legion made C. their base for the conquest of Wales about A.D. 75 and the foundations of the massive stone wall and one of its internal turrets, set up about A.D. 100 at the time when the early timber buildings within the fortress were likewise reconstructed in stone. Within the fortress were found the remains of nine barrack blocks; their walls were built of coursed masonry with earthen floors and they were roofed with red tiles

made in the legionary tiler. Among interesting relics found in one of the centurion's quarters were a moulded base (with counters), used as a gaming table. Pop. 2300.

Caermarthen, see CARMARTHEN.

Caermarthenshire, see CARMARTHENSHIRE.

Caernarvon, see CARNARVON.

Caernarvonshire, see CARNARVONSHIRE.

Caerphilly (fort of the trench), eccles. par. and mrkt. tn. in Glamorganshire, 7½ m. from Cardiff. Large collieries and ironworks near by. Manufs. linsey-woolsey, shirtings, blankets, checks, and shawls. Has ruins of C. Castle, once one of the largest strongholds in the kingdom. Pop. 36,000.

Caer Taff, see CARDIFF.

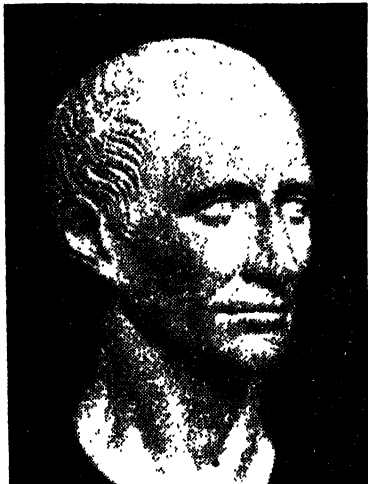
Cæsalpinia is a tropical genus of Leguminosae consisting of trees and shrubs, many of which are hook-climbers, and several being of commercial value. *C. pulcherrima*, Barbados pride, is cultivated for its beautiful flowers, as are *C. sepiaria*, Mysore thorn, which bears yellow flowers, and *C. japonica*, which will flourish out of doors. *C. brasiliensis* yields Pernambuco or Brazil wood, valuable for its red dye, while *C. sappan* yields sappan-wood or bukkum wood. *C. coriaria* is known as the divi-divi tree and *C. Bonducella* yields bonduc seeds.

Cæsalpino, *Andreas* (Latinised form of *Andrea Cesalpino*) (1519-1603), botanist and physiologist, b. at Arezzo in Tuscany. He studied at Pisa and afterwards became a prof. there, where he had charge of the botanical museum. His chief work was pub. in Florence in 1583 under the title of *De Plantis Libri XVI*. This work commenced a new era in systematic botanical research.

Cæsar, title usually borne by the Rom. emperors and by the heir apparent to the imperial throne. It was in its origin the name of the patrician family of the Julia gens. This family was one of the oldest families in Rome, and had a long and proud descent, claiming lineage with the son of Æneas, the founder of the city. By Augustus it was adopted, since he was the adopted son of the great Julius Cæsar, and by him it was passed on to his adopted son Tiberius. It was borne by successive emperors even after the direct line of the Julian family had become extinct. It represented the *second* title of the emperors, who still of course bore the title Augustus. By the heir of Adrian it was adopted as the title of the heir-apparent, and was borne by the heirs of the emperors throughout the succeeding ages; the name Augustus still continued to be the title of the emperors. The name, or derivatives of the name, was used until recently, e.g. by the tsar or king of Bulgaria, and in the title Kalsar-i-Hind (the emperor of India), a title borne by Brit. sovereigns.

Cæsar, Gaius Julius (102-44 B.C.), the greatest of Rom. soldiers and statesmen. In spite of the evidence which can be brought to the contrary, there is little doubt now that C. was b. in the year 102, on July 12 of that year. Descended from a patrician family, members of which had long been

identified with the senatorial party, C. himself from the very beginning of his political career identified himself with the democratic party. This was, no doubt, due to his connection by marriage with the famous C. Marius, who was the husband of C.'s aunt, and who had taken a special interest in the boy who had been born in the year of Marius's great victory. His early political career was highly dangerous, and at a very early age he incurred the anger of the great Sulla by his marriage to the daughter of Cinna. On Sulla's return he was degraded from his position of priest of Jupiter, and deprived of his



British Museum

GAIUS JULIUS CÆSAR

property, but his life was spared owing to the influence of his aristocratic relations and the pleadings of the college of vestal virgins. At this period he deemed it wise to leave Italy, and he saw his first military service in Asia (81 B.C.). Three years later we find him back again in Rome, the news of the death of Sulla having recalled him. In Rome there was a great democratic reaction on the death of Sulla, and although C. refused to identify himself with the party of Lepidus, he showed his active democratic sympathies by prosecuting two of the Sullan governors for extortion in their provinces. Both prosecutions failed, and C. retired for a while to Rhodes in order to study rhetoric. He took part in the third Mithridatic war, and in 74 was elected a pontifex on the death of his uncle, C. Aurelius Cotta. He almost immediately became noted as one of the democratic leaders, and took a leading part in the events which led to the sweeping away of the safeguard to senatorial rights and the partial restoration, at any rate, of the popular liberties.

Gradually he was becoming more and more friendly with Pompey. In 69 he served in Spain as a quaestor, and in the following year returned to Rome. The departure of Pompey for the E. marks the real beginning of the career which was ultimately to lead C. to the dictatorship of Rome. From this time forward he is always to be found advocating the principles of the democratic party. During this period of his life, however, he was principally noted in Rome for the number and variety of his amours, for his extravagance, and for his life of pleasure. He was, perhaps, not regarded seriously as a coming statesman, since it appeared to be almost impossible that a man of pleasure such as C. should ultimately become the master of the Rom. Empire. His extravagance and the licentiousness of his life are two traits which are characteristic of the man, and which are to be found without much seeking during every part of his career. In 65 B.C. he was elected curule ædile, and two years later he became pontifex maximus. In the same year (63 B.C.) the Catilinian conspirators were accused by the consul Cicero. The name of C. was freely mentioned as one of the conspirators, and, in fact, the senatorial party tried hard to get his name included in the list. However much C., or his friend Crassus, knew of the plot, there is no doubt but that they were both opposed to it, although they were probably bound to have known of its existence. In 62 Pompey returned from the E. to find himself in opposition to the senate, which had opposed many of his proposals, and in alliance with C., whose opposition to the senate made him a natural ally. In the next year C. went to the prov. of Further Spain, and remained there until the following year (60), when he returned to Rome.

On his return to Rome C. endeavoured successfully to reconcile the two rivals, Crassus and Pompey. In the same year (60) he became consul, and his legislation during his term of office was very favourable to the remaining two members of the Triumvirate. He ratified the acts of Pompey in the E., he gave grants of land to Pompey's disbanded veterans, and he reconciled the capitalists as well. He, however, clearly foresaw that his importance as a power in the Rom. republic must be strengthened by military force, and that it was necessary to obtain for himself the command of a prov. where he could train the legions to follow him. During his period of office he caused legislation to be passed which gave him the command of Cisalpine Gaul and Illyria, and the overawed senate added also the command of Transalpine Gaul, in order that this prov. should not be given him by the popular party. The next nine years of C.'s life are taken up with his famous campaigns, from which he was to emerge as the dictator of Rome, the founder of the Rom. Empire, and the hero of a Rom. populace. Before setting out from Rome he realised that the time had arrived when it was necessary that Rome should crush the ambitions of the Ger. tribes, or herself

fall beneath them. Already the Gers. had shown that they intended to contest with Rome the possession of Gaul; the Ædui had been defeated, the Sequani molested; it was high time that the Rom. appeared to defend these allied tribes. The first victory of C. was over the Helvetii, who were driven by the incoming Gers. from Switzerland. They demanded a passage through Rom. ter. and were refused. Forced by C. to march down the r. b. of the Rhone, they succeeded, while C. was hurrying back for reinforcements, in crossing the R. Saône, only to be defeated, crushed, and driven back to their original homes. He next succeeded in defeating the Gers. under Ariovistus, and followed this blow up by defeating the Belgæ, whose fears had been aroused by the success of C. He then marched against the neighbouring tribe, the Nervii, and defeated them at a bloody battle on the Sambro, and in this way gained for the Rom. republic dominion over the whole of Gaul save the S.W. In the following year C. was hastily recalled from Illyria in order to undertake the task of overthrowing the Veneti of Brittany, who had broken out into revolt, and this, after some little difficulty, he was successful in performing. In the meantime another of his officers had subdued the Aquitani of the S.W., so that by the end of the year the whole of Gaul lay subject to Rome. In 50 B.C. he attacked and destroyed two of the Ger. tribes who had crossed the lower Rhine, and on this occasion built the famous bridge across the riv. in ten days. In the same year he made his first expedition to Britain, actuated probably by the fact that the tribes of N. Gaul received assistance from their kinsmen in Britain. This first expedition was little more than exploratory, and accomplished nothing. The Britons of the S. coast were reduced to a nominal vassalage, but this had practically no effect. In the following year another expedition to Britain took place, and on this occasion C. stayed longer and accomplished more. He penetrated Middlesex and crossed the Thames into Essex. He defeated Cassivelaunus, who, however, was able to cause him considerable trouble. He imposed a tribute on the Britons before he finally left that country to wait for another century before the hand of Rome would be stretched out to add them to the empire. In the meantime C.'s term of office had been lengthened, and the Triumvirate had agreed that it should not terminate until 49 B.C.

The campaigns of the years 53 and 52 were of vital importance. During this period the Gers. made their last great struggle for independence. C.'s legions suffered a reverse in Gaul, a reverse which was speedily and heavily paid for by the practical annihilation of the Eburones. The following year saw the final attempt under the great leader Vercingetorix, who at the head of the Arverni rose in revolt. Successful at first in driving away the Ger. chieftain, C. suffered a severe check at Gergovia, where he was obliged to raise the siege. However, at Alesia he besieged

the successful leader, and forced him to surrender in spite of the attempts made to release him. Having conquered Gaul, C. could afford to be lenient, and he therefore imposed no hard tasks upon the defeated tribes; he allowed them to retain their customs and manners, imposed a fixed tribute, and made Gaul into a prov. Then he turned his attention to the affairs of the Rom. republic itself, where things had been taking place which demanded his immediate attention. As has been pointed out previously, the meeting of the Triumvirate in 56 B.C. had fixed the policy to be followed by the three leaders for some considerable time. But in 54 B.C. the ties that bound C. and Pompey had been somewhat loosened. Julia, daughter of C. and wife of Pompey, had *d.* Crassus had *d.* in the same year. Pompey no longer felt either bound or inclined to follow out the policy of the Triumvirate. Naturally he tended towards the senatorial party, and by 52 he had practically become the leader of that party. The agreement made with C., that he should be allowed to retain the *imperium* until he obtained the consulship in 48, was now to be broken. In order to strengthen Pompey, it was necessary to weaken C. Arrangements were made for C.'s successor to be appointed by 49, so that C. might be persecuted for some time. Negotiations were opened between the two leaders. C. came into residence on the borders of Italy proper, so that he could the more easily obtain information of what was happening in the Rom. senate. This information came chiefly through a senator whom he had bribed. C. was called upon to resign his command, and martial law was proclaimed. The two tribunes, Marcus Antonius and Cassius, fled to C. The senatorial party led by Pompey were now face to face with their greatest enemy, C. C. immediately took measures to out-manoeuvre his enemies. Pompey had the command of many more legions, but the legions were scattered. C. therefore crossed the Rubicon and marched against Pompey, who withdrew his men from Italy and took them eastward, where his name was greatest, and where his chief victories had been won. C. had reached Brindisi before Pompey and his army had embarked, but had been unable to prevent the embarkation. He now turned his attention to Spain, which he reached in June and had reduced by Aug. In that month he returned to Rome and was made dictator, a post which he only occupied for eleven days. He was elected consul for 48, and then set out for Greece to attack the army of Pompey. He first attempted to besiege the army of Pompey at Dyrrhachium (Durazzo), but was repulsed with heavy loss. Pompey, having obtained reinforcements, marched down into the plains of Thessaly, and a battle was fought at Pharsalla, where Pompey's army was completely overthrown. Pompey fled to Egypt, and was murdered there while disembarking. C. followed him, only to learn of the fate of his enemy when he landed.

C. was now appointed dictator for a year and consul for five. He did not immediately return from Egypt, but stayed there for some months, fascinated, it is said, by the charms of Cleopatra, for whose sake he embarked on the Alexandrine war, a war which he brought to a successful issue in 47. In the same year he overcame the son of Mithridates, a victory which C. commemorated in the phrase, 'I came, I saw, I conquered.' After this victory he returned to Rome. Here he first put down a mutiny of the legions, and then crossed over to Africa, in order to crush the last members of the Pompeian party. In the great victory at Thapsus he practically annihilated the leaders of the party, and one of the generals, Cato, committed suicide. In the same year he was made dictator for ten years, and towards the end of the year sailed for Spain, to put down the sons of Pompey, who still held out there. The battle of Munda, in the following year crushed that rebellion, and C. returned to Rome. On March 15, 44 B.C., he was murdered in the senate-house at the foot of the statue to Pompey. During the period that he had held the dictatorship he had exercised his authority on the whole for the good of the people. He had not had recourse to any of the atrocious massacres of Marius or Sulla. When his enemies lay crushed at his feet, he had been noble enough to raise them to a position of equality with his supporters. He had put forward many schemes which were obviously for the well-being of the republic. He reformed the calendar, he proposed to make a digest of the Rom. law. He enfranchised the Transpadanæ. He promoted schemes for the draining of the Pontine marshes, for the enlargement of the harbour of Ostia, and for the construction of a canal through the isthmus of Corinth. He was distinguished in every way; he was a great statesman, soldier, and orator. In addition, he can claim a place in hist. as a brilliant mathematician, a jurist, and an architect, together with a very high position indeed as a writer and historian. His character as a man and as a statesman has led to much discussion. On the one hand, many historians hold the view that the creation of a policy, for want of a better name known as Cæsarism, was very necessary, that the tradition and method of gov. applied to the city Rome could not be equally applied to the Rom. Empire. On the other hand, many think that C., in overthrowing the constitution and traditions of Rome, destroyed liberty, and this view has much to be said for it. The open and obvious contempt with which C. regarded the traditions of Rome cannot be passed over easily. Not that he attempted to destroy, but that by the additions which he made, for example, to the senate, he held up to open contempt the greatest of Rom. ideals. Throughout the ages the name of the pagan C. has been held up to admiration. The dark and mediæval ages brought with them a regard for C. and Cæsarism which amount to hero worship. The greatest name to

them in the pages of hist. was that of the founder of the Rom. empire. But with the Renaissance came a change in thought. C. no longer was regarded as the founder of an empire, but as the destroyer of liberty, and the names of the conspirators who overthrew him were held up to admiration. In this diversity of opinion it is impossible truly to appreciate his work and character without reference to the political ethics and manners of his age. The older authorities for the life of C. are his own *Commentaries*; biographies of Plutarch and Suetonius (*Lives of the Cæsars*); Sallust's *Catiline*; Lucan's *Pharsalia*; Cicero's letters and speeches; and, of much less importance, Appian's *History*. The *Commentaries* relate the hist. of the first seven years of the Gallic war in seven books, and the hist. of the Civil war, down to the commencement of the Alexandrine, in three books. Neither of these works completed the hist. of these two wars. The hist. of the Gallic war was completed in an eighth book, which is usually ascribed to Hirtius, and that of the Alexandrine and other wars in three separate books of which the authorship is uncertain. Appian's *Roman History*, written in Gk. (Ρωμαϊκά), in twenty-four books, treats of the Civil war in books xiii. to xxi. (Eng. trans., 1578). Shakespeare's authority for his *Julius Cæsar* was North's *Plutarch*. Later authorities include T. Mommsen, *History of Rome* (vol. iv.); J. A. Froude *Cæsar: a Sketch* (brilliant but biased), 1879 (2nd ed., 1896); Sir C. Oman, *Seven Roman Statesmen*, 1892. To these may be added E. Stoffel, *Histoire de Jules César et la guerre civile*, 1887. Reliable recent works include the *Commentaries (Cæsaris Commentarii rerum in Gallia gestarum)*, trans. by T. Rice Holmes, and the same editor's *Cæsar's Conquest of Gaul*, 1901, *Ancient Britain and the Invasion of Julius Cæsar*, 1907, and *The Roman Republic and the Founder of the Empire*, 1923; also E. Meyer, *Cæsars Monarchie und das Principat des Pompeius*, 2nd ed., 1919. On the Gallic war may be mentioned *Gallie War* (7 vols.), ed. by T. Rice Holmes, 1914; *Gallic War and other Commentaries*, trans. by G. W. A. McDevitte (Everyman's Library), 1915.

Cæsar, Sir Charles (1590-1642), Eng. judge, third son of Sir Julius C. (q.v.), was educated at Magdalen College, Oxford; fellow of All Souls, 1605; entered the Inner Temple in 1611. He was appointed master of chancery, 1615-39, and judge of the court of audience, c. 1626-42. He paid James I. £15,000 for the mastership of the rolls in 1639. D. of smallpox. His epitaph magniloquently designates him 'an equal distributor of unsuspected justice'; but George Gerrard, master of the Charterhouse, in a letter to Lord Conway, March 28, 1639, describes him as 'a very ass . . . the very anvil on which the doctors of the law of his society played.'

Cæsar, Irving, b. New York city, July 4, 1895, of Rumanian emigrant parents. Educated in New York schools and colleges, at twenty he was attached to

Henry Ford's famous peace ship, whose mission it was 'to get the belligerent soldiers out of the trenches by Christmas' (this was in 1915). He afterwards travelled through the European neutral countries as one of the secretaries of the Ford Peace Conference. C. has written hundreds of songs, among them his lyrics in *No, No, Nanette* and *Tea for Two*.

Cæsar, Sir Julius (1558-1636), Eng. lawyer, noted for his great generosity, was the son of Cesare Adelmare, physician to Queen Mary, and a descendant of the It. dukes de' Cesarini. C.'s father migrated to England, about 1550, and began practice in London as a physician, being elected fellow in 1554. He obtained letters of naturalisation from Queen Mary with immunity from taxation in 1558. On one occasion he received the magnificent fee of £100 from her for one single attendance. Queen Elizabeth also consulted him and rewarded him with leases of eccles. lands at low rents. The son, who was b. at Tottenham, was educated at Magdalen Hall, Oxford, and took degrees both there and in Paris. He was called to the Bar in 1580; became judge of the admiralty court, 1584; chancellor of the exchequer, 1606; master of the rolls, 1614. He was a friend of Whitgift and of Bacon, and had a high reputation for integrity. He wrote a treatise on the Privy Council, and other papers. He collaborated with Lord Keeper Coventry in drawing up ordinances of procedure intended to correct abuses which had grown up in the court of chancery.

Cæsarea: 1. Anct. name of Kaisárich, a coast vil. of Palestine, 27 m. from Nazareth, 30 m. from Jerusalem. Founded by Herod the Great, a very important city often mentioned in the Bible. After A.D. 70 it was the cap. of Rom. Palestine and residence of the procurators, and the eccles. cap. until A.D. 451. St. Paul was a prisoner in C. for two years. The tn. was taken by the crusaders under Baldwin I. in 1101, when the booty included the green crystal vase supposed to have been used at the Last Supper and, later, celebrated in medieval legend as the Holy Grail. C. was destroyed by Bibars in 1265. Very little remains to-day of the anct. city. The ruins are surrounded by a low grey stone wall. Coasting vessels often put in as water is good and abundant. Bosnian colonists now have a settlement there. 2. C. Philippi, now Baniás (Panaes), vil. of Palestine, near R. Jordan below Mt. Hermon, 29 m. from Tyre, 45 m. from Damascus. Founded by Philip the Tetrarch, 3 B.C. Prominent in time of the crusades. 3. Anct. name of Cherchel, a seaport tn. of Algeria, 55 m. from Algiers. Ruins are still left. The port is shallow and exposed to N. winds. Near by are large marble quarries, and mines of silver, iron, and lignite. Pop. about 4000 (com. 8000). 4. Anct. name of Jersey.

Cæsarean Operation, liberating a child from the womb by cutting through the walls of the abdomen and uterus. The name is derived from that of Julius

Cæsar, who is said to have been brought into the world in this manner.

Cæsarion (47-30 B.C.), son of Cleopatra, who declared that Julius Cæsar was his father. Though this has been denied, it is said that Antony once said in the senate that Cæsar had acknowledged the relationship. In 34 B.C. he received from Antony the title of king of kings, but four years later he was put to death by order of Augustus.

Cæsium, metallic chemical element usually associated with rubidium. It was the first metal discovered by spectrum analysis, in the mineral spring at Dürkheim and, later, in those of Frankhausen and Wheal. It occurs in the rare mineral pollucite, a hydrated cæsium aluminium silicate; in minute amount in a number of continental mineral springs; and in carnallite (hydrated chloride of potassium and magnesium). It is a silvery white metal, inflames in air when heated, melts at 26°, boils at 670°, has a sp. gr. of 1.85, and is poisonous to vegetable life. Chem. symbol Cs; atomic weight 132.8; atomic number 55.

Cæsius Bassus, Rom. lyric poet of Nero's reign; friend of Persius, whose works he ed., and whose sixth satire is addressed to him (*Schol. on Pers., vi.*). Said to have lost his life in the eruption of Vesuvius, A.D. 79. Quintilian (*Inst. x. 1*) praises him highly. Fragments of his works are in *Corpus Poetarum Latinorum*. He is identified with the author of a treatise, *De Metris*, of which fragments remain (ed. Keil, 1885). The *Ars Cæsii Bassi de Metris* (Keil, *Grammatici Latini*, vi.) is not his, but chiefly borrowed from above-mentioned treatise.

Cæsura (a 'cutting'), a metrical rest or pause usually about the middle of a line, not necessarily coinciding with a grammatical stop. The word has been taken from the classics, and is most common in Eng. heroic verse after the fourth or sixth syllable. More than one C. in a line is allowable, or again verses shorter than the decasyllable need have none. A variety of usage produces the best results. In Gk. and Lat. hexameters the best and most frequent C. is after the fifth half-foot (penthemimeral); the same is also used in the pentameter line of Ægiæos. Of course variations may occur. *See also* VERSE. *See W. Christ, Metrik der Griechen und Römer* (2nd ed. 1879), W. R. Hardie, *Res Metricæ*, 1920.

Café, *see* COFFEE HOUSES.

Caffa, *see* KAFFA.

Caffeine (C₈H₁₀N₄O₂) is a vegetable alkaloid of the xanthine group. Its chemical name is 1:3:7-trimethylxanthine, and it has been synthesised in the laboratory. Its occurrence in beverages in common use makes its study important. Thus it is the same as theine, which exists in tea-leaves to the extent of 3-2 per cent, in coffee 1.5 per cent, in Paraguayan tea or maté, and beverages concocted from the kola nut. It may be procured from a strong infusion of tea in the following manner: The tannin is precipitated by means of lead acetate, the excess of which is precipitated by passing through

it hydrogen sulphide. On filtration the liquid is evaporated down and neutralised with caustic potash, when on cooling the C. will crystallise out. The crystals are colourless, long, and silky, with one molecule of water of crystallisation. They are only slightly soluble in cold water, but easily soluble in hot water or alcohol and in chloroform. The salts are decomposed by water, but the citrate, produced by adding C. to a hot solution of citric acid and evaporating, is widely used, having the same properties as C. C. is a product of xanthine and they are both products in the breaking down of the nucleo-proteins of the plants, the final product being uric acid. In the human body uric acid is not produced by C., so that there is no danger to be feared from it by people with gouty dispositions. C. is primarily a stimulant. It stimulates the reasoning powers as well as others and prevents sleep. Unlike alcohol, its action is not followed by a sedative effect, and hence it may be termed a true stimulant. In medicine it is used as a heart stimulant, also as a diuretic. *Caffeic acid* is obtained by boiling with caustic potash caffeannic acid, which occurs to the extent of 4 per cent in coffee berries. It crystallises in yellow monoclinic crystals, and has the formula $C_6H_3(OH)_3CH=CHCOOH$.

Caffraria: *Caffrat*, see KAFFERS

Caffristan, see KAFIRI-TAN.

Calfyn, Matthew (1628-1714), Arminian Baptist minister. He was expelled from Oxford Univ. for his beliefs, and became minister at his native place, Horsham, in Sussex, where he was five times imprisoned for unlicensed preaching. His Arian doctrines led to a split in the Baptist Church (1701). But the two dissident parties came together again in 1704. There was the first deliberate endorsement of latitudinarian opinions in the article of the Trinity by the collective authority of any tolerated section of Eng. dissent. C.'s works are very rare. They include *Envy's Bitterness corrected* (c. 1674), *A Raging Wave forming out of its Own Shame* (1675), *The Great Error and Mistake of the Quakers* (no date); *Baptist's Lamentation* (no date); and numerous polemical tracts. See T. Crosby *History of English Baptists*, 1740.

Cafilla, or **Cafila**, is a term used for a company of travellers or a caravan in Arabia, Persia, and N. Africa.

Caftan, national dress of the Turks. It is usually made of woollen or silk material, and is white in colour, with a yellow flowering design. Cs. are frequently used as gifts, by the Turkish court, to Christian ambas. The term caftan is also applied to procurers of women.

Cagayan, large prov. at the extreme N. of the is. of Luzon, in the Malay Archipelago, the largest is. of the Philippines. It is extremely fertile, and rice (the staple food), sugar-cane, cotton, coffee, and cinnamon are grown. C. is also the name of the largest riv. of the is. Pop. 200,000. C. is also the name of a tn. in Mindanao Is. Pop. 28,000.

Cage-birds. From earliest times birds that are notable for their plumage, their

song, or their interesting ways have been kept in confinement as pets. The favourites among the songsters are the nightingale, blackcap, thrush, blackbird, skylark, woodlark, and starling; while the linnet, goldfinch, bullfinch, siskin, and canary are also popular. The last-named is one of the commonest C. in this country, and, though really a foreign bird, has become thoroughly acclimatised. Siskins and redpolls, and also linnets and goldfinches, have been made to draw their water and food in miniature buckets from wells beneath their bucket-board. It is, unfortunately, also the case that birds have had their eyes 'bleared' with a hot iron to make them sing better. Of other Brit. birds, the common jay and the jackdaw are often kept as C. for the sake of their entertaining ways and their powers of mimicry. Foreign C. are more sought after for their plumage than for their song, though the canary, shama, Amer. mockingbird, Virginian nightingale, Peking nightingale, bulbul, and bluebird are all good songsters. The Australian budgerigar (*q.v.*) is also popular. Parrots are much in request as C., and parakeets and cockatoos are also kept, though the latter are somewhat noisy for the house. Of the parrots, the yellow-faced Amazon is the best talker. The greys from S. and W. Africa are not acclimatised at all easily; of the two species, that from W. Africa is the hardier. Care has to be taken in the feeding of C. The soft-billed songsters, such as the thrush and the lark, should be fed on crushed hemp, bread-crumbs, and insects, and a spider is one of the best of tonics for them. The nightingale requires special attention, being difficult to feed and rear properly. Some birds, such as the finches, linnets, and canaries, eat mostly grain, while others, such as starlings, redbreasts, and wrens, feed mostly on insects or berries. Canary seed and rape seed are chiefly used for the grain-eating birds, and canary seed is the best food for all species of parrots. The ailments of C. are mostly due to excessive or otherwise improper feeding, combined with their lack of exercise in confinement. The most universal remedy is a drop of castor oil, administered with a quill or a camel-hair brush. Birds are more sensitive to draughts than human beings, and should never be placed in a window for that reason. Nor should they be kept in conservatories, or other places where the temp. is variable. Birds kept under bad conditions in this respect are always in bad health, and pulmonary troubles sometimes result. Epilepsy, due to overfeeding, constipation, and diarrhoea are also necessary when the birds are moulting. A rusty nail in the drinking water is a good thing at such times, and stimulating food should be given. See W. A. Blakston, W. Swaysland and A. F. Wiener, *Illustrated Book of Canaries and Cage-birds, British and Foreign*; C. Rogers, *Budgerigars and How to Keep Them*, 1930; L. P. Luke and A. Silver, *Ariaries, Bird-Rooms, and Cages*, 1930; C. St. John, *Canary Breeding for Beginners*, 1947.

Cages have frequently been used in the past for the imprisonment of human victims. The philosopher Callisthenes was kept in an iron cage for seven months by Alexander the Great for refusing to pay him divine honours. Catherine II. of Russia imprisoned her wig-dresser for three years in an iron cage lest people should know that she wore a wig. Edward I. confined the countess of Buchan and a sister of Robert Bruce in a similar way. The former, whose offence was placing the crown of Scotland on the head of Bruce, was placed in an iron cage on one of the towers of Berwick Castle. Similarly, Tamerlane made a public show of the Ottoman sultan, Bayazid I. Louis XI. confined Cardinal Balue, grand-almoner of France, in an iron cage in the castle of Loches for eleven years. The bodies of the Anabaptist leaders, John of Leyden, Knipperdolling, and Krechting, were exposed in iron C. at Munster, Westphalia, in 1536.

Cagliari (anct. *Carales*) is both the cap. of the prov. of C. and of the whole is. of Sardinia. Distant 375 m. S. of Genoa by water, its fine harbour is situated in the centre of the S. coast of Sardinia, at the head of the gulf of C. The course of its hist. is chequered. At first a Rom. colony, it has been successively occupied by the Vandals (A.D. 485), Justinian (A.D. 533), the Saracens (twelfth century), the Pisans, the kings of Aragon (1326-1714), Austria, and the duke of Savoy, who became king of Sardinia (until 1861). Whilst the medieval tn. ran along the topmost ridges of a hill running N. and S., the modern tn. has grown up on the lower slopes and along the coast. Strong breezes blow through the tn. in winter, but in summer the climate is African. The chief exports, are zinc, lead, and salt (obtained from a lagoon to the E.). N. of the W. lagoon, where there is a good fishing trade, stretches a fertile plain, which is, however, still cultivated in very primitive fashion. There is a tramway to Quarto S. Elena, and two railways, including the main N. line, have their terminus in C. Besides the modern citadel, barracks, and archaeological museum—the best in Sardinia—there are many buildings of great historic interest, including a domed church of the eighth century, the cathedral (built by the Pisans in 1257-1312), two great towers of the medieval fortifications, one of which commands a splendid prospect, and a univ. (dating from 1764). In the Second World War the It. base at C. was hard hit on sev. occasions, particularly in a daylight raid on March 31, 1943, when 100 Flying Fortresses destroyed or damaged upwards of twenty-five ships in the harbour and many planes at three adjacent airfields. The cathedral was damaged but has been repaired. A number of other churches were destroyed or damaged: Chiesa del Carmine, S. Caterina, and S. Domenico were destroyed; S. Agostino, S. Anna, S. Saturnino (twelfth century) were badly damaged; and the Teatro Civico was destroyed. The damage was all done by air raids, for there was no ground fighting and the enemy evacuated

the is. as soon as their position became evidently untenable. Pop. 111,000; (of the prov.) 475,000.

Cagliari, or **Callari**, Paolo, *see* VERONESE, PAUL.

Capgiostro, Alexander, Count de (1743-1795), arch-impostor of Palermo, whose real name was Giuseppe Balsamo, gave a foretaste of his vicious propensities during his education at the monastery of Caltagirone, where he horrified the monks by narrating the adventures of immoral women. Expelled from the monastery, he began by forging a will and committing a murder. For this latter crime he was imprisoned. On his release he inveigled a goldsmith, Marono, into paying away his money to discover a fictitious treasure. When Marono reached the treasure cave he was set on by six ruffians, hirelings of Balsamo, who beat him into insensibility. Dreading vengeance, Balsamo went abroad, travelling, it is said, in Greece, Egypt, Arabia, Persia, Rhodes, and Rome. In Rome he met and married a beautiful girl, Lorenza Feliciani, who proved an astute confederate in her husband's trickeries. At the monastery Balsamo had acquired a smattering of chem. and medicine, and later in Rhodes had proved a ready pupil to the Gk., Althotas, in the mysterious art of alchemy. Thus he is next found touring triumphantly through Italy and Germany, posing alternately as necromancer, physician, and freemason. At Strasburg, he grew rich with the profits of his 'elixir of immortal youth.' The count would solemnly declare he was a century and a half old, and his wife, who was only twenty, would lovingly refer to an imaginary son who was a veteran Dutch naval officer. The credulity and multiplicity of his dupes seem in these sceptical days truly remarkable, but the upper classes, from whom his victims were drawn, were at that time ill educated, superstitious, and sensual. Thus they trusted him equally as the inventor of an 'invaluable pentagon for abolishing original sin,' or the preacher of a miraculous moral regeneration, or as an Egyptian freemason who could rouse spirits from the dead, or, finally, as an advocate of altruism and a practical philanthropist. But his quackeries were one by one exposed. The Scottish physician to Catherine, at St. Petersburg, pronounced his celebrated 'apagoric food' unfit for dogs: in Paris he was deeply involved in the affair of the diamond necklace and thrown into the Bastille; in England lawyers succeeded in confining him in the Fleet. Finally, after further degradations and compulsory wanderings, this 'bull-necked forger' underwent a sentence of perpetual imprisonment at Rome for freemasonry. He d. in the fortress prison of San Leone, whilst his wife found refuge in a convent. An excellent account of this prince of charlatans will be found in Carlyle's *Miscellanies*. *See also* W. R. H. Trowbridge, *Capgiostro: the Splendor and Misery of a Master of Magic*, 1910.

Cagnola, Luigi, Marquess (1762-1833), It. architect, was a native of Milan, where

stands his splendid triumphal Arco della Pace, of white marble. Like Palladio, his predecessor, he strove to imitate the simple grandeur of classical architecture, as may be seen in his Porta di Marengo and his chapel of Santa Marcellina, also at Milan.

Cagots, name of a distinct and formerly outcast people living in the Basque provs. of the W. Pyrenees. The name is also applied to similar peoples in Béarn, Gascony, and Brittany. The origin of the C. is uncertain. Some have declared them to be descended from the Visigoths, who remained in France after their defeat at Clovis in the fifth century. Their name is explained as a corruption of *Canis gothus* (Gothic dog) or Fr., perhaps containing *-goth* (cf. *bigot*). Others have held them to be descended from the Saracens conquered by Charles Martel. Most credence is now given to the belief that they were ostracised on account of their leprosy, and have since thrown off the disease. It appears that they were formerly compelled to wear a peculiar dress and to follow certain menial occupations. They were forced to enter the churches by special doors, and in the churches they were separated by a rail from the other worshippers. They were not even allowed to walk on the high road with bare feet. There is no evidence to show that they ever used a separate language. At the time of the Fr. Revolution they were given equal rights as citizens, and they have since become more or less merged in the general peasantry.

Cagsand, see DARAGA.

Cahan, Charles H., Canadian statesman, was b. in Nova Scotia in 1861, and graduated at Dalhousie Univ. He began as a journalist on the staff of a Halifax (Nova Scotia) newspaper, and was then called to the Bar. Entering politics, he was elected in 1890 as a member of the Nova Scotia Legislature, and was soon made leader of the Conservative party. Two years later he was offered a portfolio in the administration of Sir Charles Tupper, but declined when he was defeated for Parliament. He moved to Montreal, became a K.C. and one of the leading lawyers in the dominion. After sev. defeats for Parliament, he was elected to the Dominion House of Commons in 1925 for St. Lawrence and St. George. When R. B. Bennett (q.v.) became Prime Minister in 1930, he made C. secretary of state in his Cabinet. Senior Canadian delegate to the League of Nations Assembly, 1932.

Caher, or Cahir, tn. with trade in corn and flour, in co. Tipperary, Eire, 11 m. W. of Clonmel, beautifully situated on the R. Suir, at the foot of the Galtee Mts. O. Castle stands on a rocky is. in the riv. Pop. 1900.

Cahors, cap. of the dept. of Lot in S.W. France, on the railway between Limoges and Toulouse, which lies 70 m. to the S. It has a trade in nuts, wine, and tobacco, and tanning and wool-spinning industries, besides manufs. of farm implements. Its importance rests largely on its antiquities, which include the cathedral of St. Etienne

(twelfth century), the Maison d'Henri VI. (fifteenth century), and the Pont Valentré over the Lot, a fine fortified fourteenth-century bridge. Pop. 12,000.

Caibarien, or Puerto de Caibarien, tn. and seaport situated on the N. coast of Cuba, W. Indies, 5 m. from Remedios. It possesses a good harbour, and railway communication with Espritú Santo and Remedios. Pop. 12,000.

Caicos, or Cayos, or The Keys, group of is. lying to the S. of the Bahamas, W. Indies, but placed under the gov. of Jamaica in 1874. The group consists of eight inhabited is. and sev. uninhabited rocks numbering about thirty in all. The total area is 165 sq. m. The largest, Grand C., is 25 m. long by 12 broad. The seat of gov. is at Grand Turk, 7 m. long by 2 broad. (Pop. 1800.) The inhabited is. are wooded and fairly fertile, and the climate is enervating. The chief industries are the exportation of salt, sponges, and turtle-shell, the cultivation of sisal hemp (on W. C.), and fishing. The total area (including that of Turks Is.) is 223 sq. m. There is an important cable station on Grand Turk. Turks Is. were discovered about 1512, but no attempt at occupation was made until 1678, when their value for the production of salt was recognised by the colonists of Bermuda. The first royal regulations for the gov. of the salt-ponds show that down to 1781 no permanent settlement or idea of fixed property in the ponds was entertained. There existed a 'head right' system by which one-third of the ponds was reserved for gov. expenses while the remainder was shared among the inhab. Every adult was entitled to a full share, children being allotted tenths in proportion to their height. Some of the public officials and ministers of religion received their salaries in bushels of salt, which recalls the anct. *salarium* or salt allowance of the Rom. soldier. Towards the end of the eighteenth century the Bahamas Gov. laid claim to the Turks and C. Is., and despite the vigorous protests of the Bermuda salt-rakers, it was determined by Order in Council in 1804 that the legislation of the Bahamas Gov. should extend to them. At the end of a struggle lasting fifty years, in which it was eventually recognised that conflicting interests and communication difficulties rendered common legislation impossible, a further Order in Council placed Turks and C. Is. as an independent administration under the supervision of the governor of Jamaica. Meanwhile the 'head right' system was replaced by a leasehold system. C. Is., which in 1848 were appended to Turks Is. for governmental purposes, were formerly occupied by loyalist refugees from Georgia after the declaration of independence by the U.S.A.; but the white owners, owing to losses and destruction from hurricanes and insect pests, lost heart and departed, abandoning their lands to their slaves. After incorporation with Turks Is. the exploitation of the group for salt production was mooted and in 1850 Cockburn harbour was laid out in salt

ponds on more modern lines than those of Grand Turk or Salt Cay. The hurricane of 1866 left both the gov. and the pond owners in a state of financial embarrassment and, after sev. years of hopeless struggle, the export tax on salt was abolished, drastic retrenchment effected, the elective system of legislation abrogated, and the Is. became in 1873 a Crown colony and a dependency of Jamaica. Pop. 5300.

Caillard, Sir Vincent Henry Penalver (1856-1930), political and financial expert. Educated at Eton and R.M.A., Woolwich. Received commission in Royal Engineers in 1875; attached to headquarters staff, and received medal and bronze star in Egyptian campaign, 1882. President Ottoman Public Debt Council, 1883. He became chairman of Joseph Chamberlain's 'Tariff Commission' in 1904; president, 1920. President, Federation of Brit. Industries, 1919. Pubs.: *Report on the Revenues Ceded by Turkey* (1888); *Imperial Fiscal Reform* (1903).

Caillaux, Joseph Marie Auguste (1853-1944), Fr. statesman, b. at Le Mans. was educated for the law; became inspector of finances in 1883, and in 1892 prof. in the *École des Sciences Politiques*. Elected deputy for Sarthe in 1898, in 1902, and in 1906—when he became vice-president of the Chamber. Minister of finance under Waldeck-Rousseau 1899-1902, Clemenceau 1906-8, Monis 1911. In July 1911 he became Premier and minister of the interior with a Conservative ministry, but resigned over disapproval of his conduct of negotiations with Germany concerning Morocco, Jan. 10, 1912. In 1913 he again became finance minister, in the Doumergue Cabinet. The editor of *Figaro*, Gaston Calmette, having threatened to publish letters written by C. to Mme C. while she was another man's wife, was murdered by her. C. resigned, and defended her on her trial, when she was acquitted. During the First World War he was at first paymaster-general of the forces; then he went on a mission to S. America—returning 1915. Suspected of defeatism, he was arrested Jan. 4, 1918, but not put on trial until Feb. 1920. Although the case against him collapsed, he was condemned to three years' imprisonment and to ten years' loss of civic rights and other disabilities, but he was released next day, and in 1924 received the benefit of the general amnesty. He was for a little while minister of finance under Poincaré in 1925; and again in 1926 he held that office for a few weeks. Two years later he brought about the fall of the Poincaré Gov. President of finance committee of Senate, 1932. Last appearance as minister of finance was in 1935, in Bouisson's short-lived gov. He remained chairman of the Finance Committee of the Senate until the collapse of France in 1940. C. was a politician of continental repute, but his arrogance and insincerity made him enemies in the world of politics. He was from the beginning an expert in taxation, and in his time effected reforms in many depts. of tax-

tion. His income-tax proposals excited violent opposition, but his system remained in principle substantially as he fashioned it. Pubs.: *Les Impôts en France* (1904); *Agadir—the History of a Policy* (1919); *Whither France? Whither Europe?* (1923); *Mes Mémoires* (1942-47).

Caillé, or Caillie, René Auguste (1799-1839), Fr. traveller, was b. at Mauzé in Poitou, the son of a baker. Having gone to Senegal while still a youth, he learned in 1826 that the Paris Geographical Society had offered 10,000 francs to the first traveller who should reach Timbuktou. Attired in Moorish dress, he set out from Kakouy in Sierra Leone on April 18, 1827, and reached Timbuktou on April 20, 1828, proceeding thence across the Sahara to Tangier, which he reached only after great privations. He received the 10,000 francs, and also the order of the Legion of Honour and a pension. He pub. an account of the journey, ed. by M. Jomard. See also F. Dubois, *Tombouctou la Mystérieuse*, 1887.

Cailliaud, Frédéric (1787-1869), Fr. explorer in Egypt and Nubia, was b. at Nantes. A goldsmith by trade, he was led to examine the mineral resources of Egypt, and, in so doing, located the site of the anc. emerald mines of Jebel Zabara. He made important discoveries in Siwah, his report thereon leading to its annexation by Egypt in 1820, and he also made a notable journey of discovery to the White Nile, in company with Ibrahim Pasha's expedition, and pub. the results in his *Voyage à Méroé au fleuve Blanc* (1826). He pub. other works of travel, and d. at Nantes.

Caillin, also Kallin, Irish saint, around whose name many legends have clustered. He probably lived in the second half of the sixth century. Of a peaceable nature. The anc. *Book of Fenagh* (about 1400) furnishes the materials of St. C.'s life. C. procured a country for his kinsmen, the Commaigne, to live in. He converted Prince Aedh-dubh, who gave him the fortress of Dunbaille, or Fenagh, in which to build his monastery.

Caliman, or Cayman, name given to sev. species of alligator found in Central and S. America. The C. differs in some points from the alligator of China and also of N. America, but only in minor details. Except for one Chinese species, the alligator is peculiar to America.

Cain, first-born of Adam and Eve, who slew his brother Abel, because Abel's sacrifice was accepted and his was not. A curse was pronounced upon him for this deed, and he went to live in the land of Nod. A curse was pronounced on any one who should kill him, but there was a tradition that he was slain accidentally. A sect of the Ophite Gnostics (A.D. 130) were called Cainites, as they held peculiar views of the significance of C. and Abel as types.

Caine, Sir Thomas Henry Hall (1853-1931), novelist, was b. of Manx and Cumberland parentage, at Runcorn, Cheshire, and was educated in the Isle

of Man and at Liverpool. After studying as an architect, he became leader writer on the *Liverpool Mercury*, and gradually took up literary work. He went to London on the invitation of D. G. Rossetti, and wrote for the *Athenæum*, the *Academy*, and other periodicals. After publishing *Recollections of Rossetti* (1882); *Sonnets of Three Centuries* (1882); and *Cobwebs of Criticism* (1883), he began a successful career as a novelist with *The Shadow of a Crime* (1885). His subsequent novels included *A Son of Hagar* (1887); *The Deemster* (1887); *The Bondman* (1890); *The Scapegoat* (1891); *Capt. Davy's Honeymoon* (1892); *The Manxman* (1894); *The Christian* (1897); *The Eternal City* (1901); *The Prodigal Son* (1904); *The White Prophet* (1909); *The Woman Thou Gavest Me* (1913); *The Master of Man* (1921); and *The Woman of Knockaloe* (1923). He ed. *King Albert's Book* (1914-1915); in 1928 issued an enlarged version of his *Recollections of Rossetti*. His *Life of Christ* was pub. after his death, in 1938. *The Deemster* was dramatised as *Ben-my-Chree* in 1889, *The Manxman* in 1895 (new version, *Pete*, 1918), *The Christian* in 1898, *The Eternal City* in 1902, and *The Prodigal Son* in 1905. *The Christian* is his most famous novel, though its theme is somewhat ambiguous. This novel has been trans. into most of the European languages. A dramatic work, *Mahomet*, was withheld from the stage at the request of the Turkish ambas. *The Bishop's Son* (1910), *The Eternal Question* (1910), *The Iron Hand* (1916), and *The Prime Minister* (1918) have been put upon the stage. He went to Poland in 1891 at request of persecuted Jews there, and described his experiences in *The Times*. In 1895 he went to Canada for the Society of Authors and the Colonial Office to negotiate terms of copyright. He was elected to the Manx House of Keys in 1901, and was made a K.B.E. in 1918 and a C. H. in 1922. He d. at Greeba Castle, Isle of Man, leaving a fortune of £250,000. See C. F. Kenyon. *Hall Cairne: the Man and the Novelist*, 1901; D. MacCarthy. in *Portraits*, 1931.

Ca'ing Whale (*Globocephalus melas*), cetacean of the dolphin family, is variously known as the Pilot-whale, the Black Fish, or the Social Whale. The name 'ca'ing' is derived from a Scottish word, *ca*, to drive. These whales, which feed chiefly on cuttle-fish, are mild in disposition, and are not only very gregarious, but are also more often stranded than any other species. Except for a white streak under their stomach the C. Ws. are black; their skin is quite smooth. At the tail there is a big fork. The fore limbs, which are about 5 ft. long, join the body very low down. The front of the skull is nose-shaped, and above and below the blow-hole are some dozen small conical teeth. In front of the blow-hole is a lump of fat. Generally speaking, the head is flat and broad. This genus of whale is found in almost every sea.

Cainozoic Period, see TERTIARY.

Ca ira (*It will go on*), a popular song of

the Fr. Revolution, so named from its refrain:

Ah! ça ira, ça ira, ça ira!
Les aristocrates à la lanterne.

The words, by Ladré, a street singer, were put to an older air, *Le Carillon national*. The song was prohibited by the Directory in 1797.

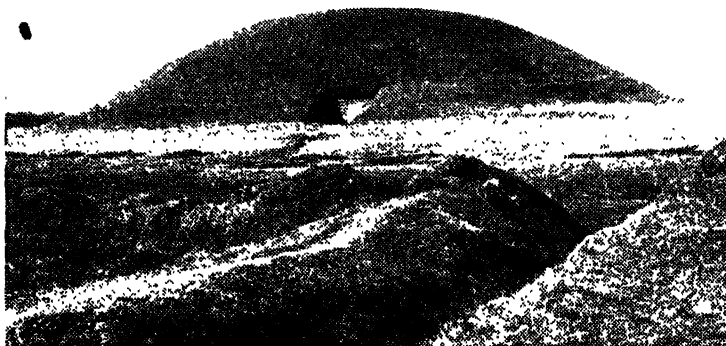
Caird, Edward (1835-1908), Brit. theologian and philosopher, brother of John C., was b. at Greenock, and was educated at Glasgow Univ. and Balliol College, Oxford. After a brilliant course at the latter univ., he was, from 1864 to 1866, fellow and tutor of Merton College. In 1866 he returned to Glasgow and became prof. of moral philosophy, and, in 1893, he became master of Balliol. In 1892 he had received the honorary degree of D.C.L. Through his pupils he has exercised a great influence on Eng. philosophy, and may be considered to have founded a school of neo-Hegelianism. His works include *A Critical Account of the Philosophy of Kant* (1877); *The Social Philosophy and Religion of Comte* (1885); *The Evolution of Religion* (1893), *The Evolution of Theology in the Greek Philosophers* (1904).

Caird, John (1820-98), Scottish divine, was b. at Greenock, and entered the ministry of the Church of Scotland in 1845. He preached a notable sermon before the queen at Craffie in 1855, afterwards pub. under the title *The Religion of Common Life*. In 1862 he was appointed prof. of theology at Glasgow Univ., becoming vice-chancellor and prin. in 1873. He delivered the Gifford lectures in 1892-93 and 1895-96, ed. and pub. in 1900 as *The Fundamental Ideas of Christianity*. His other works include *Sermons* (1858); *Introduction to the Philosophy of Religion* (1880); and *Spinoza* (1888).

Cairn, or **Carn**, is a Celtic word signifying an artificial heap of stones. Prehistoric Cs. are usually sepulchral monuments or tribal cemeteries, like that of Talten, and are found usually in some place of eminence. Cs. of the Stone Age, such as those of Maeshowe, in Orkney, or of New Grange on the Boyne, near Drogheda, are chambered, with a circular, oval, or oblong ground plan. The chambers, in which burnt and unburnt human remains are found, are small, that at Gavv'ins in the Morbihan measuring 9 ft. by 8 ft., but they are usually approached by a long passage, often covered with incised zigzag or spiral designs. The passage at New Grange is actually 63 ft. in length. The chamber roof is beehive-shaped in the Brit. Isles, but in Scandinavia it consists of huge blocks resting on the side walls. Cs. of the Bronze Age are smaller and of circular construction. Besides the central cist of unhewn slabs, which is the actual place of burial, they often contain neolithic implements and tall, flat-bottomed and richly ornamented bronze vessels. In medieval times Cs. were often used as the meeting-places of tribes, and in 1225 it is recorded that the inauguration of the new chief, O'Connor, took place at the O. of Fraech. In a charter of 1231 the

'Carne of the Pecht's Fieldis' is mentioned as a boundary to the lands presented to the monks of Kinloss, and in the Highlands it was long the custom to pile small Cs. where the coffin of a famous man was 'rested' on the way to the graveyard. Where stones were scarce, the earthen barrow, as in England, replaced the C. See also BURIAL CUSTOMS; EARTH-HOUSE.

granite running through the coarser granite of the main mass. The stone is a special favourite in Scotland (sometimes called Scotch topaz), and is used for various ornamental purposes, e.g. set in the lids of snuff-mulls, in the handles of dirks, in brooches for Highland costume, in pins and bracelets. Its value depends on transparency and colour. Quartz of



THE STONE AGE CAIRN OF MAESHOWE, ORKNEY

E.N.A.

The cairn is 300 ft. in circumference, and contains stone chambers with rude carvings and runic inscriptions

Cairn Terrier, small, short-legged breed of dog, sandy-grey or brindled in colour, some being almost black. The C. T. has a foxy head and small pointed ears. It is a good sporting as well as a good house dog. The name is due to the fact that these dogs were employed for driving foxes out of cairns.

Cairnes, John Elliot (1823-75), Irish political economist, began life in his father's brewery, but proceeded to Trinity College, Dublin, and graduated in 1848. He was called to the Irish Bar, but turned his attention to social and economic questions, and in 1856 became Whately prof. of political economy at Dublin. Three years later he became prof. of political economy and jurisprudence at Queen's College, Galway, and in 1866 he succeeded to the chair of political economy at Univ. College, London. He belonged to the same school of thought as John Stuart Mill. His works include *The Slave Power* (1862); *Political Essays* (1873); *Some Leading Principles of Political Economy newly expounded* (1874).

Cairngorm Stone (Cairngorum) (Gaelic *caru*, heap, *gorm*, blue), name of yellow and brown varieties of quartz, called after one of the peaks of the Grampians in Banffshire, where it was found originally. This mineral occurs in crystals lining the cavities in highly inclined veins of a fine-grained

yellow or brown is known as 'false topaz.' It is found also in Brazil, Russia, and Spain. The yellow, used in jewellery is often called burnt amethyst, or citrine. The pale brown is also called smoky quartz, and when almost black the stone is known as morion. The colour is probably due to an organic pigment. The mineral is also found in the mts. of Mourne, Ireland, in Arran, and other parts of Britain, and very fine specimens in Switzerland and Colorado, U.S.A.

Cairns, municipality and seaport of Queensland on Trinity Bay, Nares co., 100 m. from Cooktown. It has a fine harbour, and is in a sugar dist. with the Mulgrave gold-fields and Herberton tin-mine near. Pop. 14,000.

Cairns, Hugh McCalmont, Earl (1819-1885), Brit. statesman, educated at Belfast Academy and at Dublin. Called to the Eng. Bar, 1844. M.P. for Belfast, 1852; solicitor-general under Lord Derby, 1858; attorney-general, 1866. He was created Viscount Garmoyne and Earl C., 1878. Lord high chancellor in the Disraeli ministry, 1868. One of the finest parl. orators of his time, his best-remembered speech being the 'Peace with Dishonour,' after Majuba. See Lord Malmesbury, *Memoirs of an Ex-Minister*, 1884; J. B. Atlay, *Victorian Chancellors*, 1908; Lord Birkenhead, *Fourteen English Judges*, 1926.

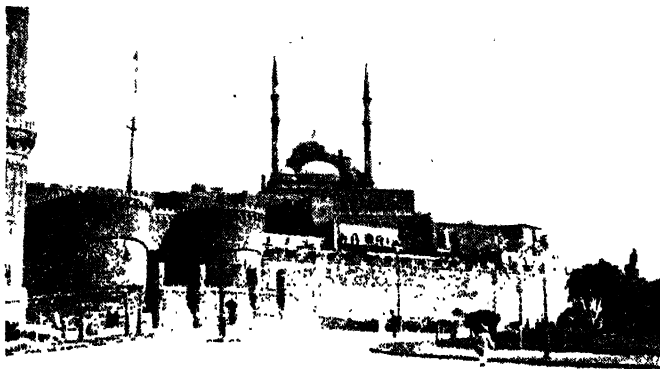
Cairns, John (1818-92), Scottish Presbyterian divine, b. at Ayton, Berwickshire. He studied at Edinburgh (1834-1841) and Berlin Univs. (1843-44), and at the Presbyterian Secession Hall from 1840. Minister of the United Presbyterian church, Berwick-on-Tweed, 1845-76; prof. of apologetics in the United Presbyterian Theological Hall, Edinburgh, 1867; principal of the Theological College, Edinburgh, 1879. C. was an excellent linguist, and travelled widely on the Continent at different times. Among his works are *Examination of Ferrier's 'Knowing and Being,'* and *The Scottish Philosophy: a Vindication and a Reply* (1856); *Life of John Brown, D.D.* (1860); *Liberty of the Christian Church,* and *Oxford Rationalism* (1861); *Thomas Chalmers* (Exeter Hall lecture) (1864); *False Christs and the True* (criticism of Strauss and Renan) (1864); *Outlines of Apologetical Theology* (1867); *The Doctrine of the Presbyterian Church* (1876); *Unbelief in the Eighteenth Century* (Cunningham lecture) (1881); *Christ the Morning-star, and other Sermons* (1893). C. also contributed to various periodicals, and wrote articles on 'Schottland' and 'Kirchliche Statistik' in the second of Herzog's *Realencyclopädie*; on 'Infidelity' in *Schaff-Herzog Encyclopædia*; on Kant in eighth ed. of *Ency. Brit.* See D. Masson, *Recent British Philosophy*, 1875; A. R. MacLennan, *The Life and Letters of John Cairns*, 1895.

Cairo is the cap. of modern Egypt and the most populous of African cities. Situated on the Nile, 12 m. S. of the head of the delta, and 148 m. of Suez by rail, it extends over an area of some 10 sq. m. Whilst the S.E. portion, including the citadel, rises on the rocks of the Mokattam Hills, the greater part of the city is built over the alluvial plain in the riv. valley. C., the fourth Moslem cap., was founded in A.D. 968 by Jauhar el-Kaid, who called it El-Kahira ('the victorious'), a name which was gradually corrupted into C. The ruins of the first cap., Mæsr, estab. in A.D. 641, together with some towers of the Rom. fortress of Babylon, a colony founded in 325 B.C., may still be seen at Mæsr-el-Atika, or old C., which lies a mile to the S. of the modern tn. Shortly after A.D. 1176 Saladin erected the citadel and a portion of the city walls. Under the dynasty of the Mameluke sultans the cap. prospered, and the tn. of Bulak was founded, which is now the flourishing port (and suburb) of C., and which lies at its N.E. extremity. Sultan Selim overthrow their sovereignty in 1517, and from this date until 1798, when the city passed by conquest into the hands of the Fr., C. was the conservative metropolis of Turkish Egypt. Three years later it was wrested from these conquerors by the Eng. and Turkish forces combined, and once more was obliged to submit to Ottoman rule. In 1811 Mehemet Ali, the Turkish viceroy, by his massacre of the Mamelukes, acquired a mastery over the city, which became the cap. of an independent kingdom. During his reign, and still more under Ismail Pasha, who ruled from 1863, rapid changes took place, fresh

quarters were designed and new thoroughfares opened out, and following the Brit. occupation in 1882 improvements multiplied thick and fast. It is to this occupation that C. owes its excellent water supply and drainage system. Formerly the death-rate was abnormally high owing to the prevalent insanitary conditions. During the First World War, C. became the administrative headquarters of the allied campaigns in Egypt and Palestine; it was also an important centre for Brit. troops, and a Red Cross base. In 1919 serious anti-Brit. outbreaks occurred in the city; demonstrations against the gov. were made, Brit. officers were fired on, and strikes took place. The military was forced to intervene to restore order. Even when the Brit. protectorate was abolished, however, and Egypt became independent, C. did not lose its rebellious spirit. Serious outbreaks occurred, for instance, in 1930. During the Second World War C. was the Middle E. G.H.Q., with great numbers of allied troops living in sprawling desert camps around the tn. Prominent allied personalities would be seen riding in the morning at the Gezira sporting club or on the famous terrace of Shepheard's Hotel. In the six months prior to the Brit. evacuation of the citadel (July 1946) 20,000 Brit. troops were moved from C. to Alexandria (see below). A N. wind and the Nile floods help to moderate the summer heat: the mean temp. for the year is 68°. After the ann. inundation has subsided, damp exhalations from the riv. keep the surrounding country moist during the late autumn months, even though hardly any rain falls. Mehemet Ali estab. cotton weaving and printing factories in Bulak, and there are a few paper mills and gunpowder works, but, speaking generally, the only commercial importance of C. is that it is a depot for the transit of goods of every variety from the Sudan, Upper Egypt, India, Persia, Asiatic Turkey, and also for many European manufs. The modern city is the fourth founded in succession on the same site, and remains of the former cities are included in it, old walls and gateways, narrow streets and latticed houses, together with many mosques. Place Atabet, to the S.E. of the Esbekiya gardens, is the central point for the electric tramways. The fine boulevard Mohammed Ali runs S.E. as far as the citadel, whilst on the S.W. the *sharia* Kasr-en-Nil leads down to the Great Nile bridge, which connects the is. Gezira Bulak, now given over to amusements, with the mainland. To the N. of the bridge are the large barracks of Kasr-en-Nil and the splendid museum of Egyptian antiquities, erected in 1902. Originally founded at Bulak by Mariette, it contains the finest collection in the world of Pharaonic relics. The national library and Arab museum, opened in 1903, lie off the boulevard Mohammed Ali. The former contains some 100,000 vols., the majority being of E. literature, and is quite unique, whilst the latter encourages the preservation of the monuments of Arabic art, which were for centuries

neglected. In 1918 a law was passed giving greater powers to the dept. charged with the preservation of anct. monuments, and many excavations and restorations were carried out. C.'s earliest Arab building is the mosque of 'Amr, dating from A.D. 643. From Place Atabet the Muski runs straight into the oriental city, which lies to the E., whilst the W. quarters are occupied by gov. offices, European public buildings, luxurious hotels, and the residential flats and villas. In this E. portion, besides the Arab city, there are the quarters of the Copts or Christians, of the Jews, and of the Franks. The streets are narrow, the overhanging upper storeys almost shutting off the blue sky overhead. Wealthy

Hasan (1358). The three gates of the city, Bab-en-Nasr, Bab-el-Futuh, and Bab-Zuweyleh, are splendid examples of the massive yet simple effects which the Mohammedan architects knew so well how to produce with the fine ashlar masonry. Beyond the E. wall of the city lie the so-called tombs of the caliphs with their graceful networks and traceries, their shining minarets and gilded domes. They are really the mausolea of the Mamelukes, whom Mehemet Ali slew. It was the latter who built the alabaster mosque in the citadel, whose dome and slender minarets are one of the picturesque landmarks of C., and in the centre of which is the celebrated Joseph's well. Among



CAIRO: THE CITADEL

Canadian Pacific

Cairenes live in modernistic apartments and fine private houses in Garden City, a residential plot on the banks of the riv.; in Gezireh, a long, thin is. in the Nile; or in the suburbs of Heliopolis, Maadi, and Helwan. The poor live around and among them, in dirty, anct. tenements and mud-brick houses, all of flimsy construction. The bazaars are always interesting, especially the Khan-el-Khalili, the Hamzawi, and the Brass Bazaar, though the Muski, which leads to them, is gradually losing its oriental character. The Anglican cathedral of All Saints overlooks the riv. and occupies a site presented to the Brit. colony by the Egyptian Gov. Azhar Univ., estab. in 971, is the great centre of Moslem intellectual life, whither 2000 students gather together annually from every E. land. C. is a city of many churches: Coptic, Gk., Maronite, Armenian, Syrian, and Rom. Catholic, besides mosques, some of which display such purity of taste, such grandeur and withal simplicity of conception, and such delicate arabesque, that they rival the Sp. palaces as specimens of the finest Arab art. Among the most beautiful are the mosques of Tulun, Kalaun, Barbuk, Kait-Bey, and especially that of Sultan

improvements and alterations carried out of recent years may be mentioned the erection of two new bridges over the Nile, the extension of the tramway system, the construction of new motor roads, and the enlargement of the suburbs. At one of these, Heliopolis, an aerodrome was erected during the First World War, and it later became the chief air station in N. Africa. The most N. part of the city consists of broad boulevards, with European-built villas, hotels, etc. The first experimental flight from C. to the Cape was made in 1920 by Lt.-Col. Pierre van Ryneveld and Capt. Brand, but it was not until April 1932 that the Brit. air route between C. and the Cape became available to passengers, the first experimental air mail being operated at Christmas 1931. To-day all the Far E. services of B.O.A.C. are operated through C., but the service to S. Africa, via C., terminates at Johannesburg, the rest of the flight to Cape Town being operated by S. African Airways. A regular air service between C. and Iraq and Persia is operated by Iranian Airways. Within the nineteenth century the pop. of C., including its suburbs, Abbasia and Mataria to the N.E., and Helwan, 14 m. to the S., more than

trebled itself. The total in 1907 was 654,476, of which some 40,000 only were Europeans. In 1937 the pop. was 1,312,000. The weird fascination of C. falls alike on European and Arab, but perhaps more on the former because of the very strangeness of all he sees. One would hardly call C. a beautiful city, yet this is the extravagant description of an Arab: 'He who hath not seen Cairo hath not seen the world; its soil is gold, its Nile is a wonder; its women are like the black-eyed virgins of Paradise; its houses are palaces; and its air is soft—its odour surpassing that of aloes wood and cheering the heart; and how can Cairo be otherwise, when it is the mother of the World?' It is oriental enough to come up to the westerner's idea of what the E. should look like, and yet sufficiently occidental to make a European or Amer. feel at home. To the newcomer it is a confused jumble of smells, flies, and noises—the last mostly Arabic music issuing from open-front cafés. Every main street is crowded with persistent hawkers, selling everything from socks, fly-whisks, and cigarettes to dubious pictures or magazines. Beggars walk the streets carrying babies, often not their own, which can be hired from poor families. Peddlars used to offer lottery tickets and even dope on the streets. Organ grinders work the streets from sunrise to sundown, accompanied by jugglers, acrobats, and gag men who put on shows especially for the benefit of foreign soldiers. The foregoing is at least a picture of what C. seemed like to the allied troops during the Second World War, and during that war C. was the most cosmopolitan city in the world, with members of the forces of all nations in every variety of uniform, while at all times there were always thousands of troops on leave in the city. The first visible step in the Brit. evacuation of Egypt was taken in C. on July 4, 1946, when the citadel was handed over to Egypt in a simple ceremony lasting half an hour. Egyptian troops took over the barracks in the historic fortress, built in the twelfth century, which had been occupied by the Brit. for sixty-five years. See S. Lane-Poole, *The Story of Cairo*, 1906; R. C. Devonshire, *Some Cairo Mosques and their Founders*, 1921, and *Rambles in Cairo*, 1939.

Cairo Declaration, made on Dec. 1, 1943, committing the U.S.A., China, and Great Britain to definite terms which fixed new boundaries for Japan on the assumption of her defeat. Japan was to be compelled to return to China all Chinese ter., including Manchuria. She was to be ousted from Korea, which 'in due course' was to become free and independent. China was to recover Formosa, conquered by Japan in 1895, and the Pescadores. These provisions achieved the objective of Amer. policy in the Orient, set fifty years previously, to re-establish the territorial integrity of China as it was before the First World War waged against her by Japan. Japan was also to be 'stripped of all the is. in the Pacific' which she occupied during the First World War. These were the

Carolines, Marshalls, and Marianas, which Japan had been allowed to retain by the Versailles settlement of 1919, nominally under mandate from the League of Nations. Japan was also to be ousted from all the ter. she had dominated or occupied since the summer of 1940. This meant Indo-China, Thailand (Siam), Burma, and Malaya; the Philippines, the Dutch E. Indies, and all the is. of the S. Pacific. In short, Japan was to be expelled from the Asiatic mainland and to lose her sea power in the Pacific. She was to revert once more to the condition of an is. nation as she was before her first conquests of Chinese ter. The U.S.A. were the more ready to impose these salutary terms from the realisation that for decades the existence of an independent China had been a major interest of the Amer. people, together with all that was implied by the 'open door' policy for commercial interests, a policy which John Hay, secretary of state under President McKinley, declared as early as 1900, and a policy to which Britain had always subscribed (see on this Sir John Pratt, *War and Politics in China*, 1943).

Cairo (pronounced Cäro), city of Illinois, U.S.A., co. seat of Alexander co., is situated at the junction of the Mississippi and Ohio Rs. about 130 m. S.S.E. of St. Louis, and 360 m. from Chicago. In 1858 C. was nearly destroyed by flood, now it is protected by 4 m. of levees. In 1888 a steel railway bridge was built across the R. Ohio. C. is a shipping port for grain and oil, and trades in manufactured goods. In the Civil war it was a depot for supplies. A marine hospital is there. It is the 'Eden' of Dickens's *Martin Chuzzlewit*. Pop. 13,500. Also the name of numerous post-vils. and banking tns in U.S.A.

Cairolì, Benedetto (1825–89). It. statesman and soldier, was b. at Pavia. He accompanied Garibaldi to Sicily in 1859, where he fought at Calatafimi and at Palermo; and to the Tyrol in 1866, where he fought at Montana. In 1870 he conducted the negotiations with Bismarck. In 1876 the Left came into power, and C. became leader of his party, and in 1877 formed a cabinet with a Francophile and Irredentist policy, on the fall of the ministry of Depretis, Nicotera, and Cisspi. General indignation was caused by his policy at the Berlin Congress, where Italy secured nothing, and the attempt of Passanante to assassinate King Humbert at Naples (1878) was the signal for his decline. In spite of his personal bravery in defending the king. In 1879 the Cairolì-Depretis ministry was formed, C. holding the office of premier and foreign minister, but his failure to foresee and intervene in the Fr. occupation of Tunis led to his final downfall.

Caisson is, in engineering work, a chamber of sheet iron, or sometimes wood, used in laying the subaqueous foundations of piers of bridges, quay walls, or dams. They are an integral part of, and permanent shell for, such foundations, and in this way they differ from coffer dams.

One type consists of a strong timber platform, to which sides are attached. One or two of the lower courses of masonry are built on to this, whilst it stands near the shore, and it is then floated out and sunk over the site of the pier, already levelled by dredging or otherwise. Previous to this, however, the detachable sides are removed. The C. of another type is bottomless, but provided with a cutting edge which digs into the earth on the application of weight. When enough earth has been excavated to allow the C. to sink to the required depth, concrete is shot into it to make the foundation solid. If the soil is hard and stony a different structure is used. The lower part of the C. is turned into a water-tight compartment, whose basis is the riv.-bed, which may be duly levelled by hand excavation. This air chamber communicates with the outer atmosphere by an air-lock, which serves as the means of entry and exit of both workmen and materials. Air is pumped down the metal column at a pressure corresponding to the depth below the surface of the water. When the men want to come out, the air of the lock is lowered to atmospheric pressure; in the same way it is raised to the pressure of the compartment when they want to return to work. The latter pressure is sufficient to counteract the tendency of the water to rise in the compartment. When the men have excavated down to a reliable stratum—the foundations of the piers of Forth Bridge reach down to the rock 75 ft. below high water—their working chamber is filled with concrete through the shafts, and the bottomless C. is thus left embedded in the work. Before such a C. is floated out, plate-iron walls are fastened round the strong roof of the working compartment, to form an upper, open box, in which the pier or quay wall is built up as the C. sinks lower and lower. The foundations of Brooklyn suspension bridge and Antwerp quay walls were both prepared by Cs. of this description. In more recent times the process has been made cheaper by the use of screw-jacks to raise the C., once the solid rock or bed has been reached. It is then available for the construction of the superimposed portion. The lifting continues till the pier rises above the water level, when the C. is ready for use elsewhere. Graving docks are often closed by means of closed iron or 'ship' Cs. These rise when the water level inside is the same as that without, and can then easily be floated to recesses at the side. That at Toulon has an area of 57,218 sq. ft., and is 62 ft. deep. Sliding or rolling Cs. are similarly used. Pneumatic Cs. may be described as a structure open at the bottom and shut at the top, in which compressed air is used to prevent external mud and water from penetrating the box. The working chamber in these Cs., forming the lower part of the C., must be practically entirely air and watertight. The opening for workmen and for materials and tools are vertical shafts fitted with air-locks, the air pressure in which may be gradually altered from that of the atmosphere to that

of the working chamber. Pneumatic Cs. can be used in depths up to over 100 ft., of water, but for depths over about 110 ft., the dredging well system is used. In shipping, a C. is a contrivance consisting of a hollow structure, provided with an air chamber, for lifting a vessel out of the water for repairs. It is sunk by being filled with water, hauled underneath the ship, and then raised by being pumped dry again. In military language a C. is an ammunition wagon. See D. H. Lee, *Sheet Piling, Cofferdams, and Caissons*, 1945.

Caisson disease is the name given to the group of morbid changes suffered by C. workers and divers. The symptoms include obstructed respiration, vomiting, pains in the joints or muscles, deafness, and paralysis, and even death may supervene. These symptoms do not appear while the pressure is being increased nor during its continuance, but only after it has been removed; and they are due to effervescence of gases absorbed during exposure to pressure. The disease is best circumvented by preparing for the immersion gradually, and leaving it gradually.

Caistor, small tn. in N. Lincolnshire with fish-rearing ponds. Pop. 1600.

Caithness, co. in the extreme N.E. of Scotland, whose boundaries are Pentland Firth on the N., which separates the mainland from the Orkneys, the N. Sea on the E., and Sutherland to the W. and S. The chief promontories of the bleak rugged coast are Ord, Ness, Duncansby, Dunnet (346 ft.), the most northerly headland of Great Britain, and Holburn. The Rts. Forss and Wick Water drain Lochs Shurrery and Watten respectively, and the Thurso empties itself into Thurso Bay. The highest mt. is Morven in the S. (2313 ft.). The is. Stroma and the Pentland Skerries belong to this co. Wick and Thurso are the chief tns. C. shares a sheriff with Orkney and Shetland, and a member of parliament with Sutherland. In spite of the severity of the winter storms and the prevalence of northerly gales, the great belt of the Atlantic prevents excessive or continuous cold. The soil is poor and the moorland barren, yet good crops of barley, oats, potatoes, etc., are grown. The wool of the native sheep is in high demand, but the inhab. live chiefly by the cod, lobster, and especially the herring, fisheries. The salmon fishing of the Thurso and the shooting preserves are excellent. Flagstones are quarried at Thurso and Halkirk. Though there are rocks of quartz-schists, the chief strata belong to the Old Red Sandstone age. The 'stacks' or detached sandstone pillars by the cliffs are very impressive. Area 438,833 ac. Pop. 26,000.

Caius, see **GAIUS**.

Caius, Dr. John (1510-73) (also known as Dr. John Kaye—C. being the Latinised form of his surname), the second founder of C. College, Cambridge, entered what was then Gonville Hall in 1529, and four years later was elected fellow. After gaining his M.D. at Padua in 1541 and travelling in

Europe, he returned to England, where he gave anatomy lectures in London and became a favourite physician of Philip and Mary. Made fellow of the College of Physicians in 1547, he was, during his membership, nine times president. In 1557 he built a new court to his old college, endowed it with sev. estates, and in 1559 became master, and as a staunch Catholic put his Protestant fellows in stocks for burning his vestments. He obtained permission for C. College to have the bodies of two malefactors each year for dissection, and may therefore be regarded as a pioneer in the cause of anatomy. Edward VI., Queen Mary, and Queen Elizabeth all employed his services as physician.

Caius College, Cambridge (pronounced Keys), was refounded in 1558 by Dr. John Kaye (see CAIUS, DR. JOHN). The name Gonville commemorates the original founder, who was rector of Terrington, Norfolk. His college was removed to the present site in 1535. The first court was rebuilt in 1868, so that the college is no longer entered by the Gate of Humility in Trinity Street. In spite of extensive alterations, this famous gate, together with the Gates of Virtue and Honour, have all been preserved. Indeed the last has been spoken of as one of the most pleasing specimens of early Renaissance work in England. The stained glass of the chapel, which contains the splendid tomb of the founder, represents miracles by healing. C. is still, as always, the great medical college of the univ.

Caivano, com. of Italy in Campania, 7 m. by rail from Naples. Pop. 15,000.

Cajababa, tn. of Peru, S. America, dept. of Cajamarca, cap. of prov. of C., 350 m. from Lima. Also a tn. of Ecuador (Kibamba or Bolivar), cap. of Chimborazo prov., 85 m. from Guayaquil, on the railway from Quito to Guayaquil. The modern tn. dates from 1797, when the anct. one was destroyed by earthquake.

Cajamarca, or **Caxamarca**: 1. N. dept. of Peru, S. America, bordering on Ecuador, crossed by the Andes. Area, about 12,550 sq. m. There are four provs., C., Cajabamba, Chota, and Jaén. Pop. 450,000. 2. Tn., cap. of above dept., 365 m. from Guayaquil. Ruins of anct. Peruvian architecture remain; the 'house of Atahualpa,' and the 'seat of the Inca' on Santa Apolonia Hill above the tn. Near by are the warm, sulphuric, mineral baths, 'Baños del Inca' (Inca's thermal baths), which are still frequented. C. is an important seat of trade and manufs. on the Pacific coast, producing textiles, straw hats, and steel. There are gold and silver mines near. It was prominent in Peruvian hist. Pop. about 15,000.

Cajanello, Duchess of, see EDGREN, ANNA CARLOTTA.

Cajazzo, tn. of Italy, in the prov. of Terra di Lavoro, situated on the Volturno, 11 m. from Capua. It is a bishop's see, and is notable for the ruins of the Rom. Calatia. Pop. 6000.

Cajeput-tree is the name given to *Melaleuca Leucodendron*, a species of Myrtaceae, and occasionally to *Litsea cal-*

fornica, a species of Lauraceae. *M. Leucodendron*, a native of Asia and Australia, is a small evergreen tree, with spikes of white flowers, which is often cultivated in bothouses. An aromatic oil, known as oil of cajeput, is distilled from the leaves.

Cajetan, Jacopo (Tommaso de Vio) (1469-1534), It. theologian, surnamed C. from his bp., Gaeta (Caleta). He entered the order of St. Dominic, 1484, studying at Naples, Padua, and Ferrara. Prof. of theology and philosophy at Brescia, Pavia, and Rome; general of his order, 1508. Leo X. made him a cardinal in 1517, sending him soon after as legate to Germany, to urge the emperor and Scandinavian kings to form a league against the Turks, and to bring Luther back into fellowship with the Church. 1523, legate to Hungary, recalled by Clement VIII.; 1527, prisoner at the sack of Rome. His works were collected in 1639. They include trans. of the Bible; *Commentary on the 'Summa' of Thomas Aquinas*; *On the Authority of the Pope*, a work censured by the Sorbonne. See Ekerman, *Dissertatio de Cardinali Cajetano*, 1761; Schilback, *De Vita ac Scriptis de Pio Cajetani*, 1881.

Cakile is the generic name of four cruciferous plants found in Europe and America. The tap-root is very long, the shoots are prostrate, the leaves fleshy, and the fruit is a two-jointed silicula in which only one seed comes to maturity. *C. maritima* is the common sea-rocket, *C. americana*, the Amer. sea-rocket.

Calabanga, or **Calabangan**, tn. on the is. of Luzon in the Philippines, situated on a small riv. which runs into the bay of San Miguel. The weaving of hempen material and the manuf. of hats are the prin. industries. Pop. 6000.

Calabar: 1. Prov. of Nigeria with 980,000 inhab. It has extensive palm oil plantations. 2. Old C., seaport on the C. R. above C. estuary, and the cap. of the E. prov. of the Brit. protectorate of S. Nigeria, W. Africa. The pure Negroes, the Efiks, who migrated to C. about 1725, live in Duke Town in the valley, whilst the prin. buildings are on the hills. The vegetation is luxuriant, and palm oil and kernels are the chief export. There are steamers to Liverpool and Amsterdam. Pop. about 15,000. 3. New C., name of a port and riv. 100 m. to the E.

History of Calabar.—The early story of C. is a story of black bondage. Its prosperity was based on the slave trade. With the abolition of the overseas trade in slaves the dominant tribe, the Efiks, were secure in their strategic position near the coast, and as the oil traffic grew they consolidated their power and wealth. But they were a degraded people. Any purity of race which may at one time have been theirs had been obliterated by concubinage with slaves of other tribes. There was no Efik man who had not slave blood in his veins. But they were important to the European traders, for whom they acted as middlemen in getting oil from inland. Hence the ship's captains and traders clothed the headmen with authority and styled them 'kings,' but

were careful to appoint those who could be relied upon to favour them in trade. These 'kings' or chiefs were further flattered by the payment of certain dues such as 'comor', a customs tax on the produce which passed to the hulks through the hands of the chiefs. Much good was effected by the Scottish mission which went out to C. in 1846 under Hope Waddell, whose most able coadjutors at this time were Hugh Goldie and Wm. Anderson. The mission soon found that the fight against cruelty and superstition would be slow and bitter. Magic was the keynote to which native life was attuned. Ekpo, lord of mysteries, was more powerful than any individual king or chief. The Ekpo Society was a secret association, initiation into whose every grade had to be purchased with money and the blood of sacrifices. To the common people Ekpo was a dread being who lived in the forest. To the chiefs Ekpo was a useful political power which they used to enforce their own authority. Ekpo laws were inviolate. Ekpo was called in for all the important ceremonies of a primitive society. The savagery of this heathenism was never more apparent than at the death of a chief. Countless victims were slain to keep him company on the dark way, or give him consequence on his arrival in the ghost-land. Frightful scenes were witnessed by members of the mission at Duke Town on the death of King Eyamba and they were powerless to stay the hands of the butchers. Gradually, however, the Scottish mission won the heathens over to different ways, and when Hope Waddell retired in 1856 the C. mission had laid the foundations of its splendid record. Trips were made up the Cross R. in search for suitable out-stations for native teachers, and for many years the Cross R. was to remain the highway for Christian advance, the explorer of the C. mission being Samuel H. Edgerley, a son of one of the pioneers who had accompanied Waddell in 1846. In 1884 a Brit. consul estab. himself at C. But the up-riv. tribes cared nothing for consular authority, and in 1889 a protectorate was proposed with consular jurisdiction for Brit. subjects, its headquarters to be at Duke Town. The most remarkable of all the women missionaries was Mary Mitchell Slessor, after whom is named the Slessor Memorial Home at Ikot Obong. The story of this quiet, fearless woman of indomitable character has been told by W. P. Livingstone in his classic of missionary biographies, *Mary Slessor of Calabar*. After her arrival trade with C. was opened up, and this left less time for drinking and intertribal fighting. In 1891 Maj. Claude Macdonald, the previous consul, was made commissioner and consul-general of the Oil Rivs. Protectorate, with headquarters at C. For years the missionaries had striven to break down the intertribal barriers which closed the Cross R. to trade and civilisation. But now the riv. was declared free, and vast areas into which none but the missionary had ventured were opened up. The C. mission

was now anxious to add industrial training to its expanding school work, and the Hope Waddell training institution soon became one of the foremost training centres in W. Africa. This centre to-day is the goal of boys from the whole mission area who seek higher education, and in its highest class students can sit for the school certificate examination, which admits them to further training at Yaba Higher College, Lagos, or for the technical depts. of gov. service. But in the 1890s the further gov. officers penetrated into the interior, the more they realised the lawless state of the country. One of the most important events in the hist. of W. Africa from the religious and political point of view was the destruction of the Long Juju at Arochuku, for this freed the country for ever from the evils of slave raids and slave-dealing on an organised scale. To break the unholy influence of the Aros, a military expedition converged on the Aro strongholds in 1901. Its work was completed by March 1902, and thereby an important new area was opened up to mission work. With the coming of the gov. and the development of trade, C. had now become a prosperous port. A considerable European pop. was now resident in Duke Town and native staff for the gov. offices had been brought in from other parts of Brit. W. Africa. Mention should be made of Dr. J. W. Hitchcock's work in starting the Uburu hospital, which to-day is one of the best-placed mission hospitals in Africa. Here was begun the use of neo-salvarsan on every case of yaws brought in, with great benefit to the victims of that disease. A new and considerably enlarged hospital was opened at Idu in 1927 by the governor of Nigeria. At the same time was begun an organised effort to deal with lepers, the bulk of the patients being employed on some beautiful outdoor occupation. There is a girls' boarding school at Asaga which is managed by the Slessor Memorial Mission. See D. M. McFarlan, *Calabar: the Church of Scotland Mission, 1846-1946*, 1946.

Calabar Bean, or the ordeal bean of Calabar, is a species of Leguminosae, *Physostigma venenosum*, found in tropical Africa. It is a perennial climbing plant with a slender stem which attains a height of 50 ft.; the flowers are peculiarly formed and have a spurred keel. The dried seed was used formerly by the natives of Africa to test people accused of witchcraft, and it possesses very dangerous poisonous properties; guilty persons were supposed to succumb to its action, and innocent ones to escape. It is of great value in ophthalmic surgery, as its application to the eye contracts the pupil, and frequently relieves pain, e.g. in glaucoma; in tetanus and other nervous diseases it is also of value. The bean owes its importance to the presence of eserine, an alkaloid which it contains.

Calabash, hard shell of the fruit of the C.-tree, or bottle-gourd, the epicarp of the *Crescentia Cujele* (Bignoniaceae) being used in tropical America, that of the *Lagenaria vulgaris*, of the order Cucurbitaceae, in

India. The common bottle-gourd is a native of India, but the C.-tree grows in W. Africa, tropical America, and the W. Indies. The shell of the fruit is extremely hard, and is made by the natives into all kinds of cups, basins, jars etc., for holding liquids. The plant is a creeping one, and it has white flowers which produce this extraordinary fruit. Sometimes one may see a specimen of C. highly polished and elaborately carved. At one time C. pipes were extremely popular.



CALABASH PLANT AND FRUIT

Calaber, Gk. poet, see QUINTUS CALABER.

Calabozo, tn. of Venezuela in the midst of a cattle-raising country. Pop 7000.

Calabria: 1. In Rom. hist. is the name of the modern prov. Leuce in the heel or S.E. extremity of Italy. The peninsula was flanked W. and E. by the gulf of Tarentum and the Adriatic Sea. From 272 to 266 B.C. there were six triumphs over the Tarentini, but Tarentum was not finally subdued till 209 B.C. In Strabo's time Tarentum and the colony of Brundisium (founded in 245 B.C.) alone retained their importance, probably because of their excellent harbours, although C. had once boasted of thirteen populous cities. In spite of the lack of rivers, its soil was fertile, and in anct. writers there is constant mention of its pastures, olives, vines, and fruit trees. There were famous dye-works at Tarentum. The great artery of traffic the Via Appia, passed through this port, and was prolonged to Brundisium. These places were also connected by a coast road passing through Manduria, Aleium, Veretum, and Lupiae. The name C. was transferred to the ter. of the Brutii on its subjugation by the Lombards in A.D. 688. 2. In modern times is the 'toe of the boot,' that is, the S.W. extremity of Italy. It has an area of 5819 sq. m., and is bounded by the sea on three sides, and on the N. by the prov. of Basilicata. All the rivers are short, except the Crati, that waters the plain of Sibari, and this is 58 m. long. In the extreme N. Monte Pollino (7325 ft.) concludes the

Apennine chain proper. The granite mts. of C. fall into two groups. The northerly, of which Botte Donato is the highest peak, is terminated by the Isthmus made by the gulfs of S. Eufemia and Squillace. Aspromonte (6420 ft.) belongs to the S. range. In summer the climate is very hot, and there have been some disastrous earthquakes. The terrible 'Messina' earthquake of 1908 destroyed Reggio. Rain torrents also cause much damage, especially now that ruthless deforestation has removed a natural protection. The coast strips are fertile. Olives, vines, fruit, and also wheat, rice, cotton, and tobacco, are cultivated, but many economic disadvantages, such as the deficiency of railways in the interior, the lack of any middle class, and the preponderance of officials, have hitherto militated against industrial organisation. The inhab. of the Albanian colonies (estab. in the fifteenth century) still preserve all their national characteristics. Reggio di C., Catanzaro, Nicastro, Calabro, and Monteleone are the chief tns. On 3rd Sept. 1943 the spearheads of the famous Eighth Army (g.v.), including Canadian troops, crossed the strait of Messina to invade the It. mainland; the initial landings took place along the coast from Catona to Reggio di C. They were covered by air and naval bombardment and by a barrage from hundreds of guns massed along the strait; but it was apparent that no serious effort was being made to defend either S. C. or Apulia. Pop. 1,772,000. See further under ITALIAN FRONT, SECOND WORLD WAR, CAMPAIGNS ON. See E. Lear, *Journal of a Landscape Painter in Southern Calabria*, 1852; C. T. Ramage, *The Nooks and Byways of Italy*, 1888; N. Douglas, *Old Calabria*, 1915.

Caladium is a genus of Araceae, and includes sev. species of S. Amer. plants, cultivated on account of their spotted skins and variegated leaves. *C. Seguinum*, the dumb-cane, grows to a height of five or six ft., and secretes an acrid poison which swells the tongue and destroys power of speech. *C. sagittifolium*, the Brazil cabbage, and *C. esculentum*, Indian kale, are both edible.

Calafatu, or Kalafat, tn. of Rumania, situated on the l. b. of the Danube, almost opposite the Bulgarian fortress of Vidin (Viddin). It is connected with Craiova by rail, and has a large grain trade. It is of historical interest, having figured in many wars. Pop. 7600.

Calahorra (anct. Calagurris), city on the l. b. of the Cidacos, in the prov. of Logroño, N. Spain. The cathedral was first restored in 1485. Thousands of pilgrims visit the shrine at Casa Santa every year. Wine, oil, and grain are brought to the markets from the Ebro valley. In 76 B.C. Sortorius defended Calagurris against Pompey. Quintilian was b. here.

Calais, seaport in the dept. of Pas-de-Calais, N. France, 185 m. N. of Paris by rail. It has a modern part to the E. of the railway, and the medieval tn., laid in ruins during the Second World War, is on an is., surrounded by the harbour basins

and the canal which connects the navigable rive, of the dist. with the harbours. Its Place d'Armes contains busts of Cardinal Richelieu and Eustache de St. Pierre, who with six other notable citizens prevailed on Edward III. not to massacre the inhab. when in 1347 they were forced to surrender. A fourteenth-century gateway is a relic of the Hôtel de Guise, formerly the guildhall of the Eng. wool merchants, but presented to the duke of Guise in 1558, when he recovered the city from the Eng. Rodin's famous group, 'The Burghers of Calais,' was completed in 1895. C. is the chief centre for the manuf. of lace and tulle, which is carried on in the quarter of St. Pierre. Its exports, most of which are sent to the Brit. Isles, are wines, spirits, woven goods, fruits, and lace, whilst cotton goods, minerals, and timber are its chief imports. During the First World War the port equipment was much improved to cope with the military needs. C. was one of the chief objectives of the Ger. invasion of France. In the Second World War, C. was the scene, from May 22 to May 27, 1940, of a most heroic defence by 3000 Brit. and 800 Fr. troops, assisted by two patrolling Brit. destroyers, against the Ger. army. The main object of the defence was to give time to the allies to prepare the defence of Dunkirk for the evacuation of the B.E.F. The Gers. threw into their attack on the citadel the whole weight of two Panzer divs., besides sending waves of dive bombers over the tn. The Brit. troops were short of everything—guns, food, and ammunition; and there were next to no fighter planes to attack the Ger. bombers. Their task was further complicated by Fifth Column (q.v.) snipers and streams of refugees, while, throughout, they were fighting in very hot weather in the midst of the foul heat of the burning town. They fought to their last round of ammunition and most of them perished; but the saving of the greater part of the B.E.F. at Dunkirk was due, in no small measure, to the fortitude and sacrifice of the defenders of C. Pop. 67,000. See also WESTERN FRONT IN SECOND WORLD WAR.

Calais, city of Washington Co., Maine, U.S.A., on r. b. of R. St. Croix, 80 m. from Bangor. Sev. bridges across the riv. connect it with St. Stephen, New Brunswick. It is the S.E. terminus of the Washington Co. (St. Croix and Penobscot) railway. C. has shipbuilding, lumber trade, foundries, and machine shops. The C. Academy is there. Pop 5600. Also the name of post-vils. in U.S.A.

Calais, Pas de, see PAS-DE-CALAIS.

Calaisis, name of Calais and the adjoining dist., occupied by the Eng. from 1347 to 1558, and then reconquered by the Fr., who called it the *Pays reconquis*. It now forms part of the arron. of Boulogne and of St. Omer.

Calamander • Wood (probably from Coromandel Coast), very valuable cabinet wood, like rosewood, only more beautiful and durable. Produced from the *Diospyros hirsuta* or *quercita* of the order Ebenaceae, of the same genus as the

ebony and persimmon trees. A native of S.E. India and Ceylon, it is becoming very rare. It yields veneers of exceptional beauty, and takes an exquisite polish. The colouring is largely chocolate and fawn. One cub. ft. weighs about 60 lb.

Calamata, see KALAMATA.

Calamary, *Loligo vulgaris*. A variant name for the squid.

Calamba, municipality, Philippine Is., 37 m. from Manila, a centre of the sugar industry. Pop. 18,000.



CALAMINT

Calame, Alexandre (1810-64), Swiss painter and engraver, was b. at Vevey, where his father was a stone-cutter. He studied painting at Geneva under François Diday (1812-77), of whose school he later became master. He travelled for some time in England, Holland, Germany, and Italy, but all his best work represents his native Swiss scenery. He succeeded in reproducing its glorious variety with truth and energy. His works are to be found in Ger. and Swiss galleries, and there are two at S. Kensington. Among the best are 'Mont Blanc,' 'Lake of Brienz,' 'The Lake of the Four Cantons,' 'Lake Lucerne.' His etchings are numerous and well known, those of the scenery of Lauterbrunnen being the most famous. There has been instituted a Calame prize for landscape, one winner being Ferdinand Hodler (1853-1918).

Calamianes, group of is. belonging to the Philippines, situated midway between Mindoro and Palawan. They have an estimated area of 615 sq. m. The prin. is. is Calamian, which is about 35 m. long and 15 m. wide. The chief production is rice; great quantities of honey and wax are also produced. Pop. 20,000.

Calamine, term applied to two ores of zinc and an alloy: 1. Zinc carbonate, occurring in rhomboid crystals, white, yellow, brown, green, or grey in colour, sometimes translucent. It is found at Matlock, Mendip, Alston Moor, Leadhills,

and at Wanlockhead in Dumfriesshire. 2. The native hydrous silicate of zinc, occurring in white, green, blue, or yellow crystals, and usually found associated with carbonate. It is also called smithsonite and hemimorphite. C. is used as a pigment in the painting of pottery, producing a fine green colour. 3. An alloy of zinc, lead, and tin formerly used as a protective coating for iron utensils.

Calamintha, genus of herbs giving the name to the common Eng. herb called calamint. The family of these plants is Labiate. The calamint is very much like the other herbs, thyme and sage, to which it is related. They are very hardy plants and easily grown in any ordinary soil found in gardens in Great Britain. There are two very small species, namely *C. glabella* and *C. alpina*, which make excellent subjects for a rock garden; the larger kind, *C. grandiflora*, does very well as a border plant. This latter species flowers in the month of June. See also BASIL.

Calamis (*fl.* 440 B.C.) was an Athenian sculptor who made statues of Apollo, Aphrodite, and Hermes, as well as part of a chariot group, commissioned by Ilaro, king of Syracuse. Archaeologists cannot point to any work as uncontestedly his, but the bronze Delphic charioteer expresses so well his merits, as also his limitations, that there is every justification for the attribution of this masterpiece to C. Pliny speaks of his grace and delicacy, and these qualities at once impress the student as he observes the refined, almost girlish, expression of the charioteer's face and the charming simplicity of the straight folds of his long and flowing chiton. Certain conventionalities in the treatment of head and drapery further convince the student that the statue must be the work of a predecessor of Myron, Polyclitus, and Phidias.

Calamites are the fossil plants of most frequent occurrence, and are believed to belong to the Equisetaceæ. Many of them are gigantic in size for their group, reaching a height of 30 ft., and they are reed-like in appearance. They seem to grow in clumps in damp clay soil or under water, and occur abundantly in the Devonian to the Jurassic strata, being especially frequent in the Carboniferous. The leaves receive various names, e.g. *Annularia*, *Asterophyllites*.

Calamus is the generic name of 200 species of tropical palms native to Asia, Africa, and Australia. Most of these plants are leaf-climbers with long thin stems, and many have hooks growing from the under side which attach themselves to passing objects and prove very troublesome. The stem of *C. Scipionum* supplies Malacca cane, of *C. Rotang*, *C. rudentum*, *C. tenuis*, and *C. verus* rattan-cane, while *C. Draco* yields the 'dragon's blood' of commerce, used in the preparation of printers' blocks and for red lacquers. See also SWEET FLAG.

Calamy, Benjamin (1642-86), Prebendary of St. Paul's son of Edmund C. the elder (q.v.), the Presbyterian divine. Educated at St. Paul's and at Cambridge.

Chaplain-in-ordinary to the king (c. 1677). His *Discourse about a Doubting (scrupulous) Conscience* appeared in 1683. It was dedicated to Jeffries. The Nonconformists accepted it as a challenge, replying to it by De Laune's *A Plea for the Nonconformists*, which cost its author his life, in spite of C.'s intercession. The execution of Henry Cornish (d. 1685) broke C.'s health. See *Biographia Britannica*, iii., 1784; T. Birch, *The Life of Dr. John Tillotson*, 1753; E. Calamy (ed. J. T. Rutt), *An Historical Account of my own Life*, 1829.

Calamy, Edmund, called the elder (1600-1666), Eng. divine, b. at Walbrook, London; educated at Cambridge, where he joined the Calvinists; became chaplain to the bishop of Ely. From 1626 to 1636 he was a lecturer at Bury St. Edmunds, but later left the Anglican Church for the Presbyterian, becoming in 1639 minister of St. Mary, Aldermanbury, London. Here he officiated for twenty years, being throughout a supporter of the Royalist cause, and becoming chaplain-in-ordinary to Charles II. He was one of the Presbyterian representatives at the Savoy conference in 1661, but was ejected from his living in the next year under the Act of Uniformity. He was one of the five compilers of *Smectynnuus* (q.v.), 1641, a polemical work written in reply to Bishop Hall's *Episcopacy by Divine Right*, 1640.

Calañas, com. of Andalusia, Spain, about 20 m. from Huelva, dist. of Valverde del Camino, producing copper. Pop. 10,000.

Calandra is a genus of insects belonging to the Curculionidæ, or weevils. *C. granaria*, the corn-weevil of our granaries, is a little beetle which bores a hole in the grain and there deposits its eggs, which hatch into a destructive grub. *C. orizæ* infests rice, and *C. palmorum* lives during its larva state in the pith of palms of S. America.

Calantas, Philippine cedar, *Cedrella toona*, a lasting wood, red in colour and much used in making cigar boxes, and lining ceilings and walls; also for building canoes.

Calanus, an anct. Hindu philosopher, belong to that sect known to the Gks. as Gymnosophists. According to Plutarch, his real name was Sphines. He came into close contact with Alexander the Great, and spent some time at his camp in India. At Pasargardæ he became sick, and, at his own request, was burned alive on a funeral pyre. Just before his death he is reported to have said to Alexander, 'I shall soon see you again in Babylon,' a speech which is regarded as a prophecy in the light of Alexander's death at Babylon a few months later. See the *Anabasis* of Arrian.

Calappa, typical genus of the Calappidæ, is a brachyurous decapod crustacean with a rounded and crab-like cephalothorax. The species have crested claws, and the abdomen is hidden under the thorax. Their geographical distribution is wide, and they are found in the warm seas. *C. granulata* is a crab which occurs in the Mediterranean.

Calarasi, or **Calarache**, prin. tn. of the dist. of C., Rumania. It is situated on a branch of the Danube, and has a good export trade in timber, wheat, hemp, and linseed. Pop. 13,600.

Calas, Jean (1698-1762), Fr. Protestant merchant, accused of having strangled his son, Marc Antoine (who had probably committed suicide), to prevent his turning Rom. Catholic. He was condemned by eight judges of Toulouse to be broken on the wheel. The charge was fostered by Rom. Catholic societies, the White Penitents and the Franciscans. This judicial murder caused an agitation in which Voltaire played a leading part. His generous efforts got the sentence against the family annulled, and resulted in the amelioration of the legal position of Fr. Protestants. In 1765 the stigma was removed from C.'s name. See A. J. Coquerel, *Jean Calas et sa famille*, 1858; Voltaire, *Traité sur la tolérance*, 1865; R. Allier, *Voltaire et Calas*, 1898; M. Chassaigne, *L'Affaire Calas*, 1929.

Calascibetta, tn. of Sicily, 15 m. from Caltanissetta, in prov. of Caltanissetta, on a hill opposite Castrogiovanni. Produces wine, silk, olive oil. Pop. 9000.

Calasião, municipality of Luzon, Philippine Is. Pop. 17,000.

Calasparra, tn. in the prov. of Murcia in Spain, lies about 40 m. distant from the anct. tn. and cap. called Murcia. Agriculture is the prin. occupation of the inhab.

Calatafimi, tn. in prov. of Trapani, N.W. Sicily, 8 m. from Alcamo, 32 m. from Palermo. Ruins of anct. Segesta are near; Garibaldi defeated the Neapolitans, 1860, about 2 m. from C. Pop. 10,300.

Calatayud, tn. of Saragossa (Zaragoza), Aragon, Spain, on R. Jalon, about 45 m. from Saragossa, on main railway to Madrid. In the older parts of the city there remain cave dwellings in the rock. There are mineral springs near, stalactitic caverns, and the ruins of Martial's bp., Bilbilis. C. is of Moorish origin, the name, in Arabic, meaning 'Job's castle.' The exterior is imposing, but the tn. is now backward and purely agric. Pop. 12,000.

Calathea, genus of Marantaceæ consisting of perennial herbaceous plants which are natives of tropical America and W. Africa. The leaves are very beautiful, and most species have a petaloid staminate. In the W. Indies the tubers of *C. Allouia* are used as a substitute for potatoes.

Calathus, genus of coleopterous insects of the family Carabide, or ground-beetles. The species are generally black or brown, and *C. cistellodes*, a black beetle with black antennæ, red at the basal joint, and either red or black legs, is commonly found on Eng. pavements.

Calatrava la Vieja, anct. fortress in Ciudad Real, Spain, on the R. Guadiana, 65 m. S.E. of Toledo. In the Middle Ages it was considered the key to the Sierra Morena. It was taken from the Moors in 1147. The military order of Calatrava was founded here in 1158. The surrounding dist. is known as the Campos de C.

Calaveras, co. of California, U.S.A., called after R. Calaveras, which runs through it to join R. San Joaquin, about 12 m. below Stockton. Bounded N.W. by Mokelumne R., S.E. by Stanislaus R. On the E. is the Sierra Nevada. C. has rich gold and copper mines, and contains one of the most famous groves of *Sequoia gigantea*. Cap., San Andreas. Pop. 7000. Area 1027 sq. m.

Calaveras Skull, a famous fossil cranium, found in 1886 by Prof. J. D. Whitney in C. co., and now at the Peabody Museum, Cambridge, Massachusetts. The discovery raised the question of the existence of tertiary man in the New World. Doubt has been thrown on its genuineness.

Calaverite, telluride of gold; contains about 44 per cent of gold and 2 to 3 per cent of silver. It is a compact mineral and massive, and resembles pale pyrites but is of greater density. It occurs in volcanic rocks in Colorado and in W. Australia. The name comes from Calaveras, Colorado, where it was first found.

Calbayog, municipality in Samar Is., one of the group of Philippine Is. Very pleasant climate. Pop. 25,380.

Calcaire Grossier, name of a number of limestones and marls very rich in fossils. They developed in the Paris basin, and are thought to date back to the middle of the Eocene period. The limestones yield many varieties of fossil shells, and also a great number of mammalian remains.

Calcareous Rocks, Soils, Tufa, etc. (correct spelling calcareous, from Lat. *calx*, limestone): 1. Rocks that contain much lime, especially in the form of carbonate (CaCO_3), whether calcite or aragonite. Usually such rocks are aqueous, and those formed in the sea are composed of the fossilised remains of marine animals (brachiopods, corals, crinoids, echinoderms, molluscs, and the like). Many Palæozoic limestones are composed of shells, corals, etc., others of foraminifera. These rocks are mostly of organic origin, the lime salts of sea-water being extracted by the living tissues of these animals and deposited in the form of carbonate of lime by shell-secreting membranes. Others are formed as precipitates by the evaporation of C. solutions, e.g. stalactite and calc-sinter (C. tufa), and probably oolite (all chemically formed). A crystalline structure, varying from partially crystallised limestones to granular statuary marble, is produced by metamorphic action. These are usually associated with the crystalline schists and the contact rocks developed by the action of heat given out by great masses of cooling granite to surrounding rocks. The existence of the carbonate in rocks can be discovered by applying dilute nitric or hydrochloric acid. Effervescence is thus caused through liberation of carbonic acid. Quicklime is obtained by calcining these rocks. 2. C. soils are produced by disintegration of C. rocks. When these rocks are pure they yield rather barren soils of little agric. value, as is the case in many chalk and limestone

dist. of Britain. They are thin and full of hard flint nodules, more adapted for pasture than agriculture. If the rocks contain lime mixed with clay so as to form marl, with a little vegetable matter added, they form a good, friable, rather light soil. It is rather difficult of drainage, as soft lime retains water so readily, but yields it up by evaporation. After rain it soon dries on the surface, but rarely suffers from severe drought. C. soils, being light in colour, absorb heat slowly. They are often rich in phosphates, but lack potash. Most soils are improved by a certain amount of C. matter. Peaty soils are often dressed with chalk. See *Fream, Soils and their Properties*, 1890; F. H. King, *The Soil*, 1900; R. G. McConnell, *Agricultural Geology*, 1902; A. D. Hall, *The Soil*, 1904. 3. C. tufa, or calc-sinter (calc-tuff), also travertine, stalactite, onyx, marbles, are porous deposits of carbonate of lime, formed by the waters of C. springs. Water charged with carbonic acid can dissolve carbonate of lime out of the rocks, and, when it emerges into the air, deposit part of it again as an incrustation. Such springs are sometimes called petrifying springs, as objects placed in the water are covered with the deposit. There are noted examples of these at Matlock, and along the R. Arno (T. Arno), near Rome. The formation there is hard and compact, and much 'travertine' is used as a building stone at Rome. Other well-known springs are at Carlsbad, Bohemia; at Clermont in Auvergne; and in the Yellowstone region, N. America. C. incrustation, often seen in caverns in limestone rocks, are varieties of C. tufa, and are called stalactites and stalagmites. When free from impurity the deposit is white or translucent, but often it is stained with other substances, and is yellow, brown, or grey in colour, and sometimes variegated. It is a spongy, cellular, or concretionary structure, often banded, and showing rings of growth. It is found in a variety of forms, massive, tubular, botryoidal, or encrusting animal and vegetable remains, such as leaves, twigs, moss, nuts, or insects. It is often quarried for building purposes, being soft at first, but becoming hard and solid through exposure to the atmosphere. The temples of Paestum, Italy, were constructed of massive C. tufa. Calc-spar is carbonate of lime, rhombohedral in crystallisation. C. waters are called hard, contain much carbonate and sulphate of lime, and form a deposit when heated.

Caicedony, see CHALCEDONY.

Calceola, or **Slipper Coral**, fossil belonging to the middle Devonian period. Abundant in the limestones of the Eifel region of the Rhine in Germany. It derives its name from its peculiar formation in the semblance of the toe of a slipper, being conical, rather flat, and curved and tapering to a blunt point.

Calceolaria (Lat. *calceolus*, a slipper, from the shape of the flower), genus of plants originally from S. America, Mexico, and the W. Indies, but now extensively cultivated by gardeners in this country.

The family is Scrophulariaceae. There are two kinds of C., the herbaceous and the shrubby. The herbaceous varieties are generally grown from seeds, sown in July in a light soil, composed of sand, leaf-mould, and loam. A cool greenhouse suits their growth at all stages, and they flower from May to July. The shrubby kinds are generally produced by means of cuttings that should be taken in Sept. These cuttings should be put in a cool greenhouse after planting them in a soil composed of fine fibrous loam and silver sand. When the roots have struck, the plants should be put in pots and placed in a frame with the sun's direct rays falling on them. At the end of Feb. the points ought to be nipped off and then transplanted into bigger pots. This transplanting should go on until the 7-in.-size pot is attained, or at all events until they can be planted out, in the month of May. If the shrubby C. is kept growing in pots, it does best in a soil similar to that adopted for the herbaceous variety.

Calchedon, see CHALCEDON.

Calciferol, in chem., a crystalline substance with a molecular formula of $C_{27}H_{44}O$. It is obtained by simple irradiations of ergosterol. It is a pure vitamin D and is present in egg yolk, cod-liver oil and other fish-liver oils.

Calciferous, name applied to a system of sandstones and limestones found in N. America.

Calciferous Sandstone, name given to a div. of the carboniferous system found in Scotland. It consists of two subdivisions, the lower being called red sandstone and the upper cement stone. It is from the shale occurring in the latter rocks that the mineral oil produced in Scotland is obtained. Volcanic rocks are also found in this stratum.

Calcination, metallurgical name for burning or roasting an ore. It can either be performed in an air blast to obtain the oxide, or without air to drive off any volatile constituent such as sulphur.

Calcite, or **Calcespar**, natural carbonate of calcium used, on account of its property of strong double refraction in making optical instruments. Usually occurs in veins associated with sulphide lead ores or haematite. See ICELAND SPAR.

Calcium, atomic number 20 (symbol Ca, atomic weight 40.1), metal belonging, together with strontium, barium, and radium, to the class known as alkaline-earth metals, on account of the alkalinity of their oxides. It does not occur free in nature, but in combination it is widespread and abundant. The carbonate occurs as limestone, coral, marble, and calcespar (calcite); with magnesium carbonate as dolomite; the sulphate as gypsum and selenite, while the fluoride is fluorspar. Many other rocks contain it, as also do organic bodies, bones being formed chiefly of the phosphate. C. is a silver-white metal forming hexagonal crystals. It is fairly hard and can be hammered out. If left in damp air it tarnishes with formation of hydroxide, but if the air is dry it remains bright for some time. It decomposes water liberating

hydrogen, and ignites if heated in air, burning fiercely with a reddish light (hence its use in C. 'flares'). Davy was the first to isolate C. in 1808 in his electrolytic researches. It may be obtained by electrolysis of the fused chloride, and Moissan obtained its crystals by the action of sodium on C. iodide. The excess of sodium is extracted by absolute alcohol. C. is used as a drying agent, as a deoxidiser in hardening lead, desulphurising petroleum, as an alloy with aluminium, and for many other industrial and technical purposes. Compounds of C. are widely used and very important substances. The oxide CaO , or quicklime, is obtained by burning limestone and coal in kilns, the carbon dioxide being driven off from the carbonate. It is white, amorphous, very infusible, and becomes incandescent when strongly heated, and was formerly used with the oxy-hydrogen flame in the old 'limelight.' Mixed with water it forms C. hydroxide or slaked lime, the combination being accompanied by evolution of heat. Slaked lime when mixed with sand forms mortar. C. chloride occurs naturally and as a by-product from many manufacturing processes. It is extremely hygroscopic when anhydrous, and is used for drying gases (except ammonia, with which it combines). Bleaching powder, conveniently though inaccurately represented as chloride of lime, is $\text{Ca}(\text{OCl})\text{Cl}$, and is obtained by the action of chlorine on slaked lime. Plaster of Paris is C. sulphate deprived of some of its water of hydration by heat. On adding water rehydration occurs, and selenite is formed and sets in a hard mass. C. carbide, used for production of acetylene, is produced by heating chalk with carbon in an electric furnace. C. sulphide is a phosphorescent substance used for luminous paint. It is prepared by passing hydrogen sulphide over heated lime. The property of luminosity is probably due to an impurity, for it is found that pure C. sulphide is not luminous. The hardness of water may be classed as permanent or temporary. The first is due to the presence of C. sulphate and the second to C. bicarbonate. The latter may be removed by boiling the water or adding lime so that the insoluble carbonate is formed and by filtration can be removed. Hardness in water is explained by the fact that the sodium stearate in the soap is converted by the C. salt in the water into C. stearate, which does not lather. C. bisulphate $\text{Ca}(\text{HSO}_4)_2$, is made by passing sulphur dioxide into milk of lime until no further absorption of the gas occurs. It is used in making lower-grade paper from wood. Wood consists mainly of two substances, lignin and cellulose, the second of which is required for paper-making. By steeping wood chips in hot C. bisulphate solution under pressure, the lignin is dissolved, but the cellulose is left unattacked. C. salts when volatilised in the flame of a Bunsen burner produce a brick-red coloration.

Calcreose, drug composed of creosote and lime, and used internally instead of pure creosote. It is a dark brown powder.

Calc-sinter, see TRAVERTINE.

Calculating Machines. From the earliest times the need for mechanical aid in performing long calculations, which require no skill, but merely accuracy, has been felt, and various simple contrivances, such as the abacus, have been invented to meet this want. More complicated machines, providing for various kinds of calculation and degrees of accuracy, have been produced in this country since the seventeenth century, one of the earliest being 'Napier's Bones.' This appliance, which consisted of ten rectangular slips of wood, having the digits and their multiples on each of the four sides, was intended for use in multiplication and division. Its use was described by the inventor, Napier of Merchiston, in his *Rabdologia* (1617), and was received with considerable enthusiasm by the mathematicians of the day. Shortly afterwards Edmund Gunter, prof. of astronomy at Gresham College, produced his surveying chain, scale, logarithmic line, and line of numbers, the principles of which are still in use in the slide rule, much employed by engineers. The calculating machines invented by Pascal in 1642, Sir S. Moreland in 1666, and Leibnitz in 1671 were of little practical use. In the two former the addition of each place of figures had to be made separately, while the last, a model of which still exists at Gottingen, was intended for use in astronomical calculations. In 1775 a machine consisting of twelve ten-sided prisms, each face of which had a rack engaging with a toothed wheel, was put on the market by Viscount Mahon. The prisms were pushed in one direction for addition and in the other for subtraction, and these operations were repeated for multiplication and division. Circular machines were invented in 1779 by Hahn and in 1784 by Muller, but the first invention of the kind of real importance was that made by Charles Babbage about 1822. His machine, which was intended to calculate numerical tables by method of 'differences,' was left uncompleted at his death. The invention of the arithmometer, by M. Thomas de Colmar, about 1850, marked a great stride forward. This machine, which will add, subtract, multiply, divide, and extract square root, is easily operated by turning a handle, and is accurate and rapid in its results. The mechanical principle is that of toothed-wheel gearing, the wheels being engaged by setting stops to the figures. Several improvements on this machine have since appeared. Another advance was made by the production of adding machines capable of dealing with money columns. One of the first of these was the Burroughs (1888); other Amer. and Brit. inventors have produced variants of this type. The cash registers so largely in use at the present day are a development along the same lines. Some of the most recent of these automatically dispense the correct change. The electric tabulating machine and the planimeter, for use in geometrical calculations, are examples of other kinds of calculating machines. Other types are the tide-predicting machine invented in

1910 by Lord Kelvin; the area tabulating machine, used chiefly in measuring leather and hides; and the curvimeter or kartometer for measuring the length of curves on, for instance, a map of a road.

Mechanical book-keeping provides a method of speedy and accurate posting to ledgers with the advantages that all accounts are kept in a legible and uniform style. Each account shows a balance which is the total of all the items posted to it and is progressive, being increased or reduced according to the nature of the postings, whether debit or credit. The arithmetical accuracy of the postings to the ledger can be checked daily or at any date by extracting a list of the balances. By the use of carbon paper a copy of each item posted to the ledger accounts is recorded line by line so that a complete summary and proof of the work posted for the day is obtained. Where customers' statements are required these can also be provided, being built up gradually as the posting is done during the month or quarter. The statement is usually the original posting, the ledger account and summary sheets being carbon copies.

Mechanical book-keeping, while used principally for sales and purchases ledgers to which large numbers of invoices on cash items are posted daily, is also used for posting the complete set of books. And machines which have typewriters incorporated are particularly useful in as much that accounts in the impersonal and private ledgers which require details and information recorded upon them can be typed on during posting. Such machines are also used for varied counting house work such as the entering of the receipts cash book, providing at the same time the customer's receipt, credit posting slip, loose cash book sheet, and bank paying-in slip. There are many different types of machines, each offering methods and systems suitable to different business and trades, and machines are designed to customers' varied requirements.

Calculus, in mathematics, any systematic method of arriving at a solution of a series of problems. Specifically, the term is applied to the differential C., with which the integral-C. is closely associated. The method has its germ in certain calculations devised by Archimedes, the Syracusan mathematician, who lived in the third century B.C. The processes referred to depended upon the comparisons of curvilinear figures or curved surfaces with the inscribed rectilinear figures or plane solids. The work of Archimedes was restricted by the poverty of symbolic methods, and it was only after the development of algebra by Vieta in the sixteenth century that the methods of Archimedes received any extension. Cavalieri proposed his method of indivisibles in 1635, and about the same time Roberval made the conception of what he called fluxions. The latter considered curves as formed by the motion of a point and obtained the direction of the tangent of the curve by a composition of the velocities of the point as determined by

the nature of the curve. Newton and Leibnitz both prepared specific notations, each for his own notions of quantity. That of Newton survived until the beginning of the nineteenth century, but has since been generally discarded in favour of Leibnitz's system. The nature of the general problem may be apprehended by considering certain operations in arithmetic to which an approximate answer only can be given. The quantity represented by the symbols $\sqrt{6}$ may be found to any required degree of accuracy, so that the square of the fraction may be found to approach 6 nearer and nearer without actually reaching that number. This may be expressed by saying that 6 is the *limit* of the value $x \times x$, where x represents the square root to any number of decimal places. In the series $1, 1 + \frac{1}{2}, 1 + \frac{1}{2} + \frac{1}{4}, 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8}$, etc., the quantities as they progress approach the value 2 nearer and nearer, although the value will never reach 2 for any extent of the progression. The series of quantities $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}$, etc., gradually decreases *without* limit, but if we take the ratio of each to its predecessor, we get $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}$, etc., a series of quantities which gradually increase, but without reaching the value 1. The increase, therefore, is not without limit, and by taking two successive quantities sufficiently small, we may get a ratio as near unity as we please. Suppose part of the circumference of a circle to be cut off by a chord; the ratio of the chord to the part of the diameter cut off by it increases as the chord approaches the circumference. In the case of the base of an isosceles triangle being moved parallel to itself towards the apex, the ratio, of course, remains the same, but the extra bulging out, as it were, of the circle means that the chord does not decrease in the same proportion as the perpendicular. Now circles are all of the same shape, and one may imagine that part of the circumference being magnified and again magnified to ocular vision while the movement of the chord goes on. The nearer it approaches the circumference the more times will the chord contain the perpendicular. By taking a sufficient number of such small chords we can approach as nearly to the length of the whole circumference as we please. It is true that the greater the number of arcs the greater the number of errors will be; but, as has been shown, the proportion of the error to its whole are diminishes, so that the total error becomes less and less. With reference to the problem of finding an arc of a known curve, it may roughly be said that the differential C. ascertains what is the form and value of the parts which are to be added; the integral C. adds them together and gives the result. The assumption made in what was formerly called the *infinitesimal* C. is that all quantities can be subdivided into an infinite number of infinitely small parts, each part being less than any assigned fraction of the whole, and yet not equal to nothing. Quantities connected with curves may be said to be of two kinds, called *constants* and *variables*. Constants

are quantities which are looked upon as always having the same magnitude, such as the radius of a circle or sphere, while variables are quantities which may have a number of particular values, as the co-ordinates of any point on the curve. Variables are also distinguished as being *independent* or *dependent*. A dependent variable changes according to changes in the value of another quantity, and is usually called a function of that quantity, thus, $2x$, x^2 , $a + bx$ are all functions of x . Independent variables are denominated by the last letters of the alphabet and constants by the first letters. When quantities are supposed to increase by infinitely small increments, the increments are called *differentials*, and the ratio of the increment of a function to that of the independent variable has usually a definite limiting value, and the study of differential C. involves in the first place the determination of these limiting ratios for certain functions of the independent variable. Integration may roughly be taken as the converse of differentiation. The requisites for a study of the C. are a knowledge of algebra to at least the binomial theorem, plane and solid geometry, plane trigonometry, and the simpler principles of the application of geometrical methods to algebra and *vice versa*. See G. A. Gibson, *An Elementary Treatise on the Calculus*, 1901; I. M. Milne-Thomson, *The Calculus of Finite Differences*, 1933.

Calculus, in medicine, a concretion forming in any part of the body by the accumulation of matter round a central core. Calculi are variously classified according to their structure, size, composition, and location. *Alternating* or *laminated* calculi are composed of layers of different material superposed in one another. As regards position, calculi may be *aural*, formed of hardened secretions in the external auditory canal; *nasal*, in the nose passages; *salivary*, formed in the salivary ducts; *bronchial*, formed in the air passages; *arthritic*, or *gouty* calculi, formed at the joints; *biliary*, or gall-stones, in the gall-bladder; *renal*, in the kidneys; *vesical* in the bladder; *prostatic*, in the prostate; and *uterine*, in the uterus. The method of their formation may vary also. *Organic* calculi are those which have a nucleus of epithelium, blood, etc.; *fatty*, those which have a nucleus of fat; *blood* calculi, consisting of fibrinous matter and blood corpuscles; and *chalky* calculi, consisting of calcium carbonate and calcium phosphate usually with some foreign body as a nucleus. *Urinary* calculi are those formed in the bladder and urinary tract. They consist of concentric layers of substances crystallised out of solution and cemented together by mucus, etc. The substances may be uric acid and urates, or phosphates of calcium and magnesium, or mixed calculi of both urates and phosphates, or calcium carbonate, or organic substances found in the urine, as cystin, xanthin, and fibrin. The calculi are commonly called sand, gravel, or stones, according to their size, and are usually

the result of some derangement of the general health. *Secondary* calculi are those formed as a result of the diseased condition of the urinary tract, and are, therefore, often met with in *cystitis* or inflammation of the bladder. Treatment varies with the composition of the concretions and the conditions which have set them up. The introduction of solvents is of value in some cases, but stubborn growths need to be crushed or removed by surgical operation. 'Cutting for stone,' or lithotomy, is an operation of great antiquity. Calculi often cause little trouble to the person affected, but as there is a risk of their being drawn into narrow passages and thus causing possibly dangerous obstructions, prompt treatment is usually advisable.

Calculus of Variation, see **VARIATION**.

Calcutta, the second city of the dominion of India and, until recently, seat of the presidency of Bengal, but now cap. of the prov. of W. Bengal. It is situated on the E. bank of the R. Hugli, being connected by a bridge with Howrah on the W. bank, about 80 m. from the sea. The city, which is the terminus of numerous railways and canals, has a port extending 10 m. along the riv., with excellent anchorage and a depth of water permitting vessels with a draught of 26 ft. to enter at all times. There are both wet and dry docks, the chief being the Kidderpur, and the Upper and Lower Union Docks. The chief hindrance to navigation is formed by shifting sandbanks. The waterway of the Hugli is connected by the Nadiya R. with the Ganges, by the Sundarbars with the Brahmaputra, while the Midnapur Canal forms a highway for vessels to the W. The city, which is well drained and has an excellent water, gas, and electricity supply, and a tramway service, consists of a European and a native quarter. The native quarters, though still being improved, are squalid, the dwellings being built of mud or bamboo. The European, which lies E. of the maidan, or great park, is entirely W. in appearance. The Chowringhee, or residential portion, contains some splendid mansions. The commercial part of the city is centred on the site of the old Fort William, and contains most of the gov. and other public buildings. These include the Gov. House, the high court, the tn. hall, the mint, the cathedral, and numerous museums, colleges, and churches. The present Fort William (1757-73) stands in the maidan, the large open area round the fort, and which is C.'s glory: it is 2 m. long by 1 m. broad. The native city has some fine streets and sev. magnificent palaces of Indian potentates. C., from its position as the natural outlet of the Ganges and Brahmaputra valleys, has an enormous trade, having only comparatively recently taken second place to Bombay as a commercial centre, and dealing with about a third of the total trade of India. The exports, which considerably exceed the imports, consist of jute, indigo, rice, wheat, oil-seeds, opium, cotton, tea, sugar, coffee, hides, silk, salt-petre, matting, etc. The imports include

cottons, linens, and silks, hardware and metals, coined silver, wines and spirits, and salts. The manufs. include sugar refineries and cotton mills. A thousand industrial concerns employ over 150,000 persons. Jute is the most important industry, and employs some 50,000 males and 10,000 females. There are also ironworks and timber yards. Over 300,000 season ticket holders travel into C. every day. There are only about 470 females to every 1000 males. Probably not more than 250,000 of the inhab. are permanent residents. In certain areas overcrowding is excessive, and 181 in 1000 of the pop. of C. are illiterate.

than one-third Moslems, and some 4½ per cent Christian; in 1941 they numbered 2,108,000 (including suburbs), and in 1947 the pop. of Greater Calcutta was estimated to number about 4,500,000.

Calcutta Cup, trophy competed for annually by England and Scotland at rugby football, presented by the Calcutta Club.

Calcutta Sweepstake was promoted annually by the Royal Calcutta Turf club, the prizes being given on the result of the Derby horse-race run at Epsom usually on the first Wednesday of June every year, but occasionally on the last Wednesday of May. The 'sweep' was nominally



THE HOWRAH BRIDGE, CALCUTTA

Canadian Pacific

The univ. of C. was founded in 1857, and the Senate House on the W. side of College Square in 1872. In the grand hall, 120 by 60 ft., the convocations for conferring degrees take place. There are 20,000 students in C. studying in the affiliated colleges where they are required to live in hostels.

The hist. of C., which takes its name from Kalkata, on the site, begins in 1686, when Job Charnock estab. a factory of the E. India Company there. The old Fort William was erected in 1696. In 1772 C. became the cap. of Bengal, and in 1773 of Brit. India until superseded by Delhi in 1912. A notorious event in the hist. of C. was the atrocity of the Black Hole of C., 1756 (see BLACK HOLE OF CALCUTTA). The Indian Premier of Bengal announced in 1940 that the prov. gov. had decided on the removal of the Holwell Monument commemorating the tragedy. The original obelisk erected by Holwell was removed in 1821, the later monument having been erected in 1902.

The pop. are two-thirds Hindu, less

private, being limited to the members of the club, each drawing a number for which he paid about 10 rupees, but experience showed that tickets were freely transferred through members to the general public in all parts of the world. The drawing took place in Calcutta, generally on the Saturday before the Derby was run, and ingenious precautions were taken to ensure perfect fairness. The stakes were very high, and in 1929 three prizes totalled £135,000; in 1930 it was decided not to publish any figures in relation to the sweepstake.

Caldara, see CARAVAGGIO; ITALIAN ART. Caldas da Rainha, tn. 47 m. N. of Lisbon, and lies in the prov. of Estremadura in Portugal. Noted for its sulphurous and saline springs. 'Caldas' is a Sp. and Portuguese term for 'hot springs.' The bathing estab. was founded in 1485 by the queen of John II.

Caldas da Reyes, tn. in Spain in the prov. of Galicia, and 5½ m. distant from Pontevedra.

Caldecott, Randolph (1846-86), Eng.

artist, worked in a bank, 1861-72, but always showed a taste for art. His first sketches appeared in local papers, *Wall o' the Wisp* (1868), and the *Sphinx* (1869). In 1872 he became a student at the Slade School. He became famous as illustrator of Washington Irving's works. 'Old Christmas' (selections from the *Sketch-book*) appeared 1875; 'Bracebridge Hall,' 1876. In 1882 he became a member of the Institute of Painters in Water Colours, exhibiting there, at Grosvenor Gallery, and at the Royal Academy. In 1876 his oil-painting, 'There were Three Ravens sat on a Tree,' was in the Royal Academy. His greatest work was the series of coloured books for children, starting in 1878 with *John Gilpin* and *The House that Jack Built*, ending in 1885 with *Elmy on Madam Blaize* and *The Great Panjandrum Himself*. See R. Blackburn, *Randolph Caldecott: Personal Memoir of his Early Art Career*, 1886.

Calder, Sir Robert (1745-1818), Brit. admiral. He entered the navy in 1759, and was present at the battle of St. Vincent (1797), on which occasion he was knighted for bringing home dispatches. In 1804 he was promoted to the rank of rear-admiral; in the following year he was stationed off Cape Finisterre to intercept the Fr. and Sp. fleets, fleeing before Nelson from the W. Indies. C. succeeded in capturing two Sp. ships, but was outnumbered, and retired to Brest. He was tried by court-martial, and censured for an error of judgment. He retired from active service, but rose to the rank of admiral in 1810.

Calder, name of four rivs. in England: 1. In W. Riding, Yorkshire, rising near Burnley and joining the R. Aire at Castleford; length 40 m. 2. In Lancashire, joining the Ribble near Whalley. 3. In Cumberland, flowing into the Irish Sea 10 m. S.E. of Whitehaven. 4. In Lancashire, joining the R. Wyre at Garstang Church.

Calderari, Ottone, Count (1730-1803), It. architect, b. at Vicenza. He formed his style on the model of Palladio, and imitated him with great success. Among his chief works were the palaces of Bonini, Loschi, Cordellina (1776), which is one of his best productions, and Antisola at Vicenza, and the seminary at Verona, which is generally acknowledged to be his masterpiece. He was an associate member of the Institute of France, and pub. a treatise on architecture. His plans were pub. posthumously (1807-17) by Diedo as *Opere di Architetture*. D. at Vicenza. See his *Life and Works* (in Fr.) by J. le Breton, 1804.

Calderón de la Barca, Don Pedro (1600-83), Sp. poet and dramatist, b. in Madrid, of a noble family; educated at the univ. of Salamanca and showed great precocity, producing a play, *El Carro del Cielo* (The Chariot of Heaven) at the age of thirteen. He seems to have served with honour as a private soldier in sev. campaigns in Italy and the Low Countries during 1623-29, and having already become famous as a dramatist, was invited to the court of Philip IV., and made

a knight of the order of St. James about 1636. He produced an enormous number of plays of all kinds till about 1651, when he entered the church, and in 1653 became a canon of Toledo, thereafter confining himself mainly to works on sacred subjects. He gained great preferments in the church, becoming a chaplain to the king in 1663, and later superior of the congregation of San Pedro. As a dramatist, C. ranks second to Lope de Vega, whom he excelled in moral depth and purity and grace of expression. He fell far below Lope in invention and ingenuity, and his work suffers from his disregard of conventional dramatic rules, his brilliant imagination leading him into extravagances. The lofty moral standard of his plays and their refined clearness of language made them a valuable influence in an age when the drama was beginning to suffer from the lasciviousness and floridness of Lope and his school. His great fault is a lack of insight into human nature, but his plots are managed with such skill and spirit that this defect is not immediately apparent. While his plays were very popular at court, they had qualities of simplicity and precision of diction which rendered them intelligible to the lower classes as well as to educated audiences. His best general plays are *El Mágico Prodigioso*, a religious drama somewhat reminiscent of *Faust*, and probably the best known in this country, part of which has been trans. into Eng. by Shelley; *La Vida es Sueño* (Life is a Dream), a philosophical play which runs the former very close in its continental reputation; *El Principe Constante* (The Constant Prince), a historical drama on the subject of Prince Ferdinand of Portugal, which, together with the former, has been trans. into Ger. by Schlegel; *El Acáde de Zalamea*; *El Divino Orfeo*; *El Purgatorio de San Patricio*, another religious play; *La Dama Duende* (The Fairy Lady), a 'cloak and sword' play; *El Médico de su Honra* (The Physician of his own Honour); *El Pintor de su Deshonra*; and *El Mayor Monstruo los Zelos* (No Monster like Jealousy), tragedies of passion. But in the opinion of many critics his sacred plays, *Autos Sacramentales* (6 vols.), contain his best work. His collected plays were first pub. at Madrid in 1682-91, and later eds. have been issued there in 1848-50 and 1882. The best ed. of the *Autos* is that issued at Madrid in 1759-60. There is a good Ger. trans. by Lorinser (1882) and Eng. trans. of different plays by Denis MacCarthy (1853-73), Edward FitzGerald (1853 *et seq.*), Archbishop Trench (1856), and N. Maccoll (1888). See Archbishop Trench, *Essay on Calderón*, 1820; E. J. Hasell, *Calderón*, 1879; J. H. Bridges, *Essays and Addresses*, 1907; S. do Madariaga, *Shelley and Calderón, and other Essays on English and Spanish Poetry*, 1920.

Calderon, Philip Hermogenes (1833-98), Anglo-Fr. artist, b. at Pottiers, of Sp. parentage. He studied in Paris under Picot, and in London. He exhibited at the Royal Academy from 1853, and at the Paris exhibitions of 1867 and 1878. He

was elected an associate of the Royal Academy in 1864. Academician in 1867, and Keeper in 1887. His subjects were chiefly historical, his most important works being 'The Renunciation of St. Elizabeth of Hungary' (1891); 'Her Most High, Noble, and Puissant Grace' (1886) (gold medal 1867); 'The Gaoler's Daughter,' and 'The Proposal.'

Calderón, Rodrigo (d. 1621). Sp. adventurer, b. in Antwerp. Patronised by the duke of Lerma, chief minister of Philip III., who gave him titles and honours and a large salary for sharing the burdens of office. C. eventually became a secretary of state, in which capacity he roused the jealousy and hatred of the court. On the fall of his patron C. was accused of murder, and, after languishing in prison for two years, was tried by order of the duke of Olivarez, who had become chief minister under Philip IV. He was found guilty and executed. He is the hero of Bulwer Lytton's *Calderon the Courtier*.

Calderon, Serafin Estébanez (1801-67), Sp. writer, celebrated for his brilliant sketches of Andalusian scenes and manners, which he contributed to the *Carlas Españolas*, a weekly Madrid magazine. Canovas del Castillo, C.'s nephew, wrote his biography, called *El Solitario y su Tiempo*, wh. li he pub. with his writings in 1883.

Calderón, Ventura García (b. 1886), considered one of the best writers that Sp. S. America has produced, was b. in Peru. He is the son of a former president of Peru, who preferred imprisonment and exile to the shame of signing a treaty that he considered dishonourable for his country. As a result, the son has lived a large part of his life in France and Spain. In his books he writes of Peruvian native subjects in the Sp. language, but with a grace he has partially borrowed from the Fr. His best-known vols. are *The Vengeance of Condor*, *Danger Death*, and *Colour of Blood*, all of which are collections of short stories of which he is considered the S. Amer. master.

Calderwood, David (1575-1650), Presbyterian divine and eccles. historian, b. at Dalkeith, Midlothian. He was educated at the Edinburgh Univ., and became minister of Crailing, Roxburghshire (1604). He opposed the designs of James VI. to introduce Episcopacy into Scotland, and was tried before the Scottish Parliament and banished. He resided in Holland from 1619 to 1625, where he wrote extensively on controversial subjects, and on his return to Scotland he collected material for his *History of the Kirk of Scotland* (1678). He also wrote *Altare Damascenum* (1621), and took part in drawing up the *Directory for Public Worship in Scotland*. Consult the life by T. Thomson prefixed to the *History*, printed by the Woodrow Society in 1842-45.

Calderwood, Henry (1829-97), Scottish minister and philosopher, educated at the Edinburgh Univ. and Theological Hall of the United Presbyterian Church. He was appointed examiner in philosophy, Glasgow, 1861; prof. of moral philosophy,

Edinburgh, 1868, and chairman of the first school board of that city, 1873-77; author of *The Philosophy of the Infinite* (1854); *The Relations of Mind and Brain* (1877); *Evolution and Man's Place in Nature* (1893). See life by his son, W. Calderwood, and D. Woodside, 1900.

Caldey, Is. of Pembrokeshire, Wales, 2½ m. S. of Tenby. Has a Cistercian abbey and an agric. college.

Caldwell. This name occurs as a par. in Renfrewshire, Scotland, and in many parts of the U.S.A. There is a city of that name in Kansas; a co. in Kentucky; a par. in Louisiana; a vil. near New York; a tn. near Texas, and a city in Idaho.

Caldwell, Anne, see MARSH, MRS.

Caldwell, Robert (1814-91), Anglican coadjutor bishop of Madras, b. near Antrim. He was sent out to India by the London Missionary Society, but joined the Church of England, and was consecrated bishop of Tinnevely as coadjutor to the bishop of Madras in 1877. He wrote a *Comparative Grammar of the Dravidian or S. Indian Family of Languages* (1856); and assisted in a Tamil translation of the Prayer Book, 1842-72, and the Bible, 1858-69. See *Reminiscences* (1894).

Caleb, son of Jephunneh, of the tribe of Judah, and one of the spies appointed by Moses to explore the land of Canaan. C. and Joshua, the son of Nun, were the only spies privileged to enter 'the land flowing with milk and honey,' for the other ten spies brought back an unfavourable report and caused the children of Israel to rebel. They acknowledged that the land 'flowed with milk and honey,' but they declared that the cities were well protected and that the people were of giant-like proportions. C. and Joshua were anxious to fight their way to Canaan, with the result that they were spared to see the event accomplished. C. received Hebron and its dist. as his portion.

Caledon: 1. Tn. in Cape Province, S. Africa, 87 m. by rail S.E. of Cape Town. It is on the Zwartberg, and has seven thermal springs, strongly radio-active, whose content of ferrous carbonate held in solution is declared to be four times as great as that of any other springs known. 2. Riv. of S. Africa rising in Mont-aux Sources in the Drakensberg, and flowing into the Orange R., forming for the greater part of its course the boundary between the Orange Free State and Basutoland. Length 220 m. (See illustration, p. 130.)

Caledonia, anct. name of that part of Scotland lying N. of the firths of Clyde and Forth. The term is still used in poetry for the whole of Scotland.

Caledonia, New, see NEW CALEDONIA. **Caledonian Canal**, chain of lochs, united by artificial canals, which stretch N.E. and N.W. across Scotland, connecting the N. with the Irish Sea. It traverses the Great Glen of Albin, through the counties of Inverness and Argyll, from Moray Firth to Loch Eil. The lochs are Beaulie, Ness, Oich, Lochy, Eil, and Linnhe. The total length of the canal is nearly 62 m., the canals being 23 m. long. The work of cutting these channels was begun in 1803, under the supervision of Telford. The

canal was opened for navigation in 1823, but the work was not completed till 1847. The average depth of the artificial channels is 17 ft., the breadth at the surface being 120 ft., and at the bottom 50 ft. The total cost of construction was £1,311,270. The canal enables vessels to avoid the dangerous route via Pentland Firth and the Hebrides, and is chiefly used by fishing craft and tourist steamers.

and Gourock, and to Oban and Ballachulish. The railway was amalgamated in 1923, together with numerous other national and local lines, with the L.M.S. Since Jan. 1, 1948, the Scottish railways so amalgamated have been organised as the Scottish region of the Brit. Railways system.

Calembour, or **Calembourg**, play upon words, based upon the difference in



A. J. Bowland

A VALLEY IN THE MALUTI MOUNTAINS ALONG THE CALEDON RIVER,
SOUTH AFRICA

Caledonian Market, so-called 'thieves' market,' held near the Caledonian Road, London, in the par. of Islington, and once known as the Islington Cattle Market. It ranks in reputation with the famous Rasta of Madrid, but though some stolen goods may find their way to the market, it is by no means ill conducted and unquestionably good articles may be found by the bargain-hunter. Before the development of the trade in frozen and chilled meat from abroad, it performed its original function of a cattle market.

Caledonian Railway. The company was formed in 1845, amalgamated and absorbed the Scottish Central and Scottish N.E. railways, together with a number of small lines which served tns. N. of Perth in 1865-66, and obtained possession of the Forth and Clyde Canal and the Monkland Canal in 1867. The total length of line was 1080½ m. The main lines ran from Carlisle to Aberdeen via Stirling and Perth, Edinburgh to Glasgow, Greenock,

meaning of words pronounced alike, in great favour among the Fr. wits of the eighteenth century. The name is said to be derived from an abbot of Kahlenberg, an amusing personage, or a teller of amusing anecdotes, in old Ger. tales, or possibly from a count of Kahlenberg, who was notorious for the amusing blunders in speaking Fr. at the court of Louis XV.

Calenberg, or **Kalenberg**, former principality of Hanover, which was traversed by the Rs. Weser and Leine and had an area of 1050 sq. m. The name was taken from an anct. castle near Schulerberg. In the Middle Ages the principality belonged to Lüneburg, and after descending from one branch of the House of Brunswick to another, it came in 1705 into the possession of Ernst August, electoral prince of Hanover.

Calendar (from Lat. *Calends*, or *Kalends*), means of distributing time with respect to its natural divs. in periods for the purposes of civil life. The most

obvious and most natural of all divs. was that of the day, a period marked out by the diurnal revolution of the earth on its axis, and the alternation of light and darkness. The solar year, which completes the circle of the seasons, was the largest div. The period from the new moon to new moon marked out the month. The anct. Egyptian year consisted of twelve months of thirty days, together with five supplementary days. Calculating their year in this way, they lost one complete day in every four years, so that in the course of time they caused a complete revolution of the seasons. The Gks. divided their month of thirty days in three equal divs., a method which revolutionary France at a later date tried to follow. The Rom. days of the month were calculated *backwards* from three fixed periods, the Calends, the Nones, and the Ides. The Calends was always the first day of the month, the Nones always the ninth day before the Ides, and the Ides in the middle of the month either in the 13th or 15th. The method of calculation was as follows: The days between the Calends and the Nones were the days before the Nones, the days between the Nones and the Ides, the days before the Ides, and the days between the Ides and the end of the month, the days before the Calends, and in the calculation of the day of the month, the days were counted inclusively. The proverbial phrase *Ad Kalendas Græcas* is equivalent to 'never,' as the Gk. C. had no Calends. The C. of practically every civilised state is borrowed from that of the Roms. Originally, it would seem, the Rom. C., as ascribed to Romulus, consisted of only ten months, which began with March and ended with Dec. This, however, only allowed for 304 days, and no known arrangement seems to have been made for the remaining days. Under Numa two additional months were added to the C., one, Jan., at the beginning of the year, the other, Feb., at the end. Ultimately this was changed so that the two additional months fell at the beginning of the year. All the months consisted of 29 and 30 days alternately, so that the year now consisted of 354 days, which was increased to 355, from the superstitious belief of the luck of odd numbers. Still the year was over ten days short of its correct period, and an additional month was intercalated in Feb. every two years. This month, which consisted alternately of 22 and 23 days, made the year one day too long, and additional means had to be adopted to correct this mistake. The length of the intercalated month does not appear to have been regulated by any fixed principle, with the result that it came to be a weapon of some effect in the hands of the pontiffs with whom the regulation of the C. rested. They curtailed the year in order to spite their enemies, they lengthened it in order to benefit their friends. By the time that Cæsar became the dictator of Rome they had reduced the C. to chaos, and one of his first steps was to attempt, successfully within limits, the reform of the C. By the year 46 B.C. there was a difference of

three months between the civil Rom. year and the astronomical year. With the help of Sosigenes, an astronomer from Alexandria, Cæsar fixed the average length of the year at 365½ days. Every fourth year was to have 366 days, the ordinary years containing only 365. The civil year was to be regulated by the sun, the intercalary month was abolished, and in order that the days of the year should be properly restored 67 days were inserted in the current year, which consisted of 445 days, the last year of the era of confusion.

The first year of the Julian C. was 46 B.C., or 708 A.U.C. The number of days in the months of the Julian C. were 30 and 31 alternately, with the exception of Feb., which was to have, in ordinary years, 29 days, and in leap years 30. This order was only upset in the time of Augustus, who named the eighth month of the year after himself, and in order that it should have the same number of days as the seventh month, named after the great Julius, took one day from Feb., and decreed that in future Feb. should in ordinary years have 28 days, and in leap years 29. In order also that three months of 31 days should not come together, he decreed the alteration of the number of days of the four last months of the year as follows: Sept., 30; Oct., 31; Nov., 30; Dec., 31. They had previously been: Sept., 31; Oct., 30; Nov., 31; Dec., 30. The pontiffs, who still had charge of the C., made the mistake of allowing one leap year every three years, instead of every four. This mistake was discovered and corrected during the reign of Augustus, who ordered the intercalating of the additional day to be dropped until the error had been corrected. The Julian C., although a vast improvement on the older method of calculating the year, yet made the year some 11 min. 14 sec. too long. Gradually this came to be recognised, and by the sixteenth century the C. was some ten days wrong. Already ideas had been put forward for its correction. At the council of Nicea, the vernal equinox, which fell on March 25 in the year 46 B.C., fell on the 21st. Efforts had been made by astronomers to correct the fault, but it was not until Pope Gregory XIII. took up the matter that the fault was corrected. By that time it had been made obvious that the error amounted to three days in 400 years. Gregory issued a bull by which the ten days, which represented the difference between the date of the equinox in 325 and in 1582, were annulled, and Oct. 5 was recognised as the 15th. In order also that the fault should not again occur, it was ordained that the centennial years should not be recognised as leap years, save where they were divisible by 400. Thus 1600 was a leap year, 1700, 1800, and 1900 were common years, and 2000 will be a leap year. This method of calculating the year was called the Gregorian C. new style. It was promulgated by a bull, and found immediate acceptance in Spain, Portugal, and parts of Italy. France adopted the Gregorian C. in the same year. Prussia, the Ger. Rom. Catholic states, Holland,

Flanders, and Switzerland adopted the change on Jan. 1, 1583; Poland in 1586, Hungary in 1587. Naturally enough, the proposal of the Catholic Church did not find immediate acceptance in the Protestant countries. Scotland adopted the change in 1600, making also Jan. 1 the beginning of the year. The greater number of the Ger. states and Denmark adopted the new style about the end of the seventeenth century. Sweden adopted it gradually between 1700 and 1740. England, held back to a large extent by vulgar and ignorant prejudice, did not adopt the new style until 1752. For a long time she had probably found it inconvenient to calculate her chronology by means of a system long given up by W. Europe and also antiquated. The C. (New Style) Act was passed in 1750, and the difference, which amounted to eleven days, was rectified by calling Sept. 2 Sept. 14, 1752. The first day of the year was also changed from March 25 to Jan. 1. The bill was not passed without considerable outcry from the mob, who went about crying for the restoration of their cloven days. The Russian, Gk., Serbian, and Rumanian Churches did not abandon the Julian C. until May 1923, when the Gregorian, slightly modified, was adopted.

Hebrew Calendar.—The Jewish year consists of 12 or 13 months, according to whether the year is ordinary or embolismic. The year is lunisolar, and the date is calculated back to the creation, which is computed as having taken place 3760 years and 3 months before the beginning of our Christian era. The ordinary year has only 354 days, but the embolismic 384; the embolismic year is obtained by the intercalation of a month of 29 days, called *Veadar*. This intercalated month occurs seven times in a cycle of nineteen years, and readjusts the Jewish year with the solar year. The day is held to begin with the sunset, but in reality the day begins always at 6 p.m. and continues for the successive 24 hours. The hour is divided into 1080 equal parts, called *halaqim*, of which each *helaq* is equal to 3.3 sec. The Jewish month consists of 29 days, 12 hrs. 44 min. 3½ sec. The names of the Jewish months are Tishri, Heshvan, Kislev, Tebet, Sebat, Adar (Veadar in embolismic years), Nisan, Iyar, Sivan, Tammuz, Ab, Elul. Each of the months has 30 or 29 days, alternately. The Jewish New Year's Day is the 1st Tishri, which falls between Sept. 5 and Oct. 5. In 1948 the 1st Tishri fell on Oct. 4, the Jewish year being A.M. 5709.

The Muslim Calendar.—The era of the E., or the era of the Hejira, is dated from the first day of the month preceding the flight of Mohammed from Mecca to Medina. The era therefore began on July 16, 622. The year is purely lunar, and composed of twelve lunar months, which contain 30 and 29 days respectively. The years are divided into cycles of thirty years, nineteen of which are ordinary and eleven of which contain one extra day added to the last month of the year. Obviously, with such a system the months

are not kept in any way to the same season according to the solar year, but run through all these seasons in the course of about 32½ years. The Muslim year begins in the month called Muharram, which corresponds with Nov. 3 of the year 1948, and is the beginning of the 1368 year of Hejira. The Muslim months are Muharram, Saphar, Rabia I., Rabia II., Jomada I., Jomada II., Rajab, Shaaban, Ramadan, Shawwal, Dulkaada, Dulhoggia. The month Ramadan is observed by all Moslems as the month of abstinence.

The Revolutionary Calendar.—The Revolutionaries, flushed with success, decreed in the National Convention of 1793 that the year of the Christian era should no longer be observed as the civil year, but that a new era, dating from the commencement of the republic, should be estab. Accordingly, the date Sept. 22, 1792, was fixed as the first day of the new era of freedom. The model they chose to establish themselves on was essentially Grecian. The year was to consist of twelve months of 30 days. There were to be five complementary days which were to be celebrated as holidays, and were dedicated to Virtue, Genius, Labour, Opinion, and Rewards. Every fourth year was to have another complementary day, which was to be called Revolution Day. The period of four years was to be called a Franciade, and the months were to be equally divided into three periods of 10 days each. The months, commencing on Sept. 22, 1792, were to be as follows: Vendémiaire, Brumaire, Trimaire, Nivose, Pluviose, Ventose, Germinal, Floréal, Prairial, Messidor, Thermidor, Fructidor. An elaborate system also was evolved, by means of which the centurial error would be corrected, but the Gregorian C. was adopted in 1806, by a decree of Napoleon. *Consult* R. Lamont, *The Roman Calendar and its reformation by Julius Caesar*, 1920; A. Philipp, *The Calendar: its History, Structure, and Improvement*, 1921; W. Schultz, *Zeitrechnung und Weltordnung* (Leipzig), 1924; R. Sewall, *The Siddhantas and the Indian Calendar*, 1924.

Calendering, process of producing a glazed or polished surface upon paper, linen, and cotton. The term is a corruption of 'cylindring,' having reference to the usual method of passing the material between revolving cylinders, usually of steel or hydraulically compressed paper, under high pressure. The principles are illustrated by the domestic iron and mangle.

Calends, or Kalends, see CALENDAR.

Calendula, genus of plants of the order Composite, common to the Mediterranean. *C. officinalis* is well known in England as the pot-marigold, Mary-bud, or golds, and is a very hardy garden plant. *C. arvensis*, the field marigold, grows profusely in vineyards of the Rhine.

Calenius, Walter (d. 1151), archdeacon of Oxford, from 1115 to 1138. The name C. was given to him by John Bale, it being an adjective formed from *Calena*, a supposed name for Oxford (really a misreading for Calvea, the name of a Rom.

station at Silchester). According to Geoffrey of Monmouth, this Walter brought from Brittany the Breton or Welsh original which Geoffrey professed to translate in his *History of the Kings of Britain*.

Calenture (from Sp. *calentura*), temporary delirium of fever to which sailors are prone in hot climates. The nature of the disease is somewhat obscure, but it is brought on through exposure to the sun's rays.

Calepino, Ambrogio (1435-1511), It. lexicographer, b. at Bergama, and became an Augustine monk. His whole life was spent in the compilation of a polyglot dictionary of which the first ed. appeared at Reggio in 1502. Eleven eds. were pub. by the Aldi between 1542 and 1592.

Calewatta, see DARLING.

Calexico, city in Imperial co., California, U.S.A. Pop. 5500.

Calif, see CATTLE.

Calgary, city in the prov. of Alberta, Canada; the centre of a ranching and agrio. dist., founded in 1883, with a pop. of 100,000. It is an important junction on the main line of the Canadian Pacific Railway, 40 m. from the Rocky Mts., whence it obtains a supply of coal. The railway here rises to 3437 ft. above sea level. It has an institute for technology and art, and a public library of 20,000 vols. There is a Normal school for the training of teachers. There is also a stock exchange of increasing importance; the well-organised telephone system of Alberta is centred here, and there are more than seventy local trade unions, and a dept. of Labour. Workshops of the Canadian Pacific Railway are estab. here, and its industries include corn mills, saw mills, and iron foundries. C. is on the Lethbridge-Edmonton branch of the Trans-Canada Air Lines system.

Calhoun, John Caldwell (1782-1850), Amer. statesman, b. in Abbeville co., S. Carolina, of Scots-Irish parentage. He graduated at Yale in 1804, and then entered the legal profession. In 1811 he represented his native state in Congress, and strongly supported measures which led to the declaration of war with England (1812-15). He was secretary of war in Monroe's Cabinet (1817), and twice became vice-president of the U.S.A., in 1825-29 and 1829-32. In 1829 he showed that his political views were undergoing a change, and in 1831, in his *Address to the People of South Carolina*, he definitely severed his connection with President Jackson, by setting forth his theory of state rights as opposed to federal rule. He retired from the vice-presidency and sat in the Senate from 1832 till 1843, when he became secretary of state under Tyler. C. strongly opposed war with Mexico (1846-47) and championed the slave-holding states (1848), honestly believing slavery to be a blessing to master and slave alike. He d. at Washington. For his life, consult R. S. Jenkins, 1851, and R. K. Cralle, in the collected ed. of his works (1853-55); for his political and social views, and for the hist. of his time, consult the life by Von Holst,

1882. His *Correspondence* was pub. by J. F. Jameson in 1900.

Call, tn. of Colombia, in the dept. of Cauca. It is situated on the Rio C., near its junction with the Rio Cauca, at an elevation of 3100 ft. It is an important commercial tn., and contains the fine Ionic church of San Francisco. Pop. 105,000.

Calibration, term which was originally applied to the measurement of the bore or calibre of a cannon, an accurate knowledge of which was essential. Passing through the meaning of measurement of the bore of *any* tube it has now reached the meaning of the comparison of the readings of any instrument with what it should indicate. In manufacturing a scientific instrument for which accuracy is required, it is found that the most satisfactory method of procedure is not so much to graduate the scale so as to give very accurate readings, but to make the scale roughly accurate and then attach a list of corrections. As an illustration of the methods used we may take the case of some electrical instruments. An ammeter measuring continuous current can be calibrated by comparison with a tangent of galvanometer of which we know that the tangent of its angle of deflection is proportional to the current flowing. This gives a means of comparing the divs. of the ammeter scale among themselves, but if the values recorded are to be compared with actual current values, the constant of the galvanometer must be found by means of a voltmeter or similar instrument. Similarly, an ammeter measuring alternating currents may be calibrated by means of an electro-dynamometer, the deflections of which are proportional to the square of the current. The principles of C. are best illustrated in the case of the ordinary mercury in glass thermometers. In the process of manuf. the tube is scratched at points reached by the mercury at the freezing and boiling points of water. The distance between these marks is divided into a hundred parts, each part called a degree. But this assumes that the bore of the capillary tube is constant throughout its length, which is never true. The process of C. consists in observing the length of a detached column of mercury at different parts of the tube.

Calibre, see GUN.

Caliche, impure sodium nitrate, or Chile salt-petre. Formula NaNO_3 . It is from C. that the world's supply of sodium nitrate is obtained. The deposits occur only in N. Chile, notably in the prov. of Tarapaca.

Calico-printing, process of impressing on cotton or other textiles certain designs in colours. The art was known to the Egyptians, even as far as the effect of certain substances called mordants in making the colours permanent in the fabric. It was also known in quite ant. times in India, whence, through the agency of the Dutch E. India Company, the trade was brought into Holland. It was introduced into London in 1676, Glasgow in 1738, and into Liverpool in 1764. The essential principles of the

methods have remained the same, but the development of the use of machinery and the extension of chemical knowledge have made the operations less tedious and more varied in their colour-effects. There are two processes of printing, block-printing and machine-printing. In the former, a wooden block is engraved with the design by hand, exceptionally fine work sometimes being done on copper plates let into the wood. The design for machine-printing is first of all engraved upon a soft steel roller, which is hardened and made to impress the design in relief on a second steel cylinder. This cylinder is hardened in its turn and finally transfers the original design to a copper roller. Each colour to be printed demands a separate roller, so that machines carrying as many as twenty copper cylinders may be employed. Each printing cylinder is mounted so as to press against a large central roller, around which the cloth to be printed passes. The colour is supplied to each copper cylinder by a colour-box in which a small roller revolves up to its axis at the same time pressing against the copper cylinder. The 'colour doctor,' a thin steel blade fitting against the surface of the copper cylinder before contact with the cloth, removes excess of colouring matter; while another steel blade, called the 'lint doctor,' is similarly fitted after the printing cylinder leaves the cloth to remove all impurities communicated by the cloth. There are many 'styles,' or methods, of colour printing, some involving the printing of mordants first and dyeing the whole material after, some which involve the oxidation of the colour material used, and some which require the application of steam at considerable pressure to fix the colours. Mordants may be defined as substances which have an affinity for the fabric on the one hand and an affinity for the colouring material on the other; they thus serve to hold the colouring matter in place. They vary in composition according to the purpose they have to serve, and it may be noted that the same colour material may give different colours with different mordants. In the 'madder style,' for example, a cloth may be printed with four or more different mordants in the printing machine. After being dried in a drying chamber, the pieces are put through a process called ageing. This consists of subjecting them to the influence of heat and moisture, by which certain necessary physical and chemical changes in the printed mordants are brought about. The next process, called dunging, consists of passing the cloth through a hot solution which removes any uncombined mordant or thickening agent. A solution of cows' dung was formerly used for this process, but many effective substitutes have been discovered. The material after being thoroughly washed is ready for dyeing, a process usually occupying one or two hours. The material then has to be 'cleared,' that is, the colour has to be taken out of those portions not mordanted. This is done by means of a hot soap solution and a chlorine solution, all colours not 'fixed' being thus removed. In

colouring with indigo or aniline black, it is customary to print a 'resist,' that is, a substance which prevents the incorporation of the colour material with the fabric; the coloured portion will then ultimately be that portion not treated with the resist. Steam is used with some colouring substances either to fix them in the fabric by mere mechanical blowing through, or to effect a desired chemical change, or, when, albumen is used as a fixing agent, to bring about the required coagulation. See C. O'Brien, *Calico Printing*, 1892; W. Watson, *Textile Design and Colour*, 1937.

Calicut, seaport of Malabar dist., Madras, India, on the coast, 84 m. N.W. of Coimbatore. It was the first place in India visited by Europeans, Pedro do Covilhão calling here in 1486 and Vasco da Gama in 1498. It had been a great centre of native trade, but declined under Portuguese rule, and only revived after its occupation by the Eng. in 1792. It has given its name to calico. Its industries are cotton spinning and weaving, and it exports tea, coffee, coco-nuts, and spices. Pop. 127,000, mostly Muslim Moplahs, the rest being Hindus.

Calidāsa, or Kālidāsa, Hindu poet of the post-Vedic period of Sanskrit literature. The dates of his life are extremely uncertain. He seems to have lived during the reign of Vikramāditya of Ujjain, but as there were sev. monarchs of that name from 57 B.C. to A.D. 1050, this does not assign any very definite limits. He has been traditionally assigned to the first century B.C., but modern scholarship tends to place him considerably later. His most famous works are his dramas, especially *Sākuntala*, which, when first introduced to Europe through the trans. of Sir Wm. Jones in 1789, was received with great admiration. A later trans. by Monier Williams appeared in 1856. His other dramas are *Vikramorvasi* (The Hero and the Nymph), containing some fine lyrical passages, and *Mālavikāgnimitra*, a comedy. There are also assigned to him two epic poems, *Raghuvansa*, trans. into Eng. by P. de Lacy Johnstone, 1902, and *Kumāra Sambhava*, only remarkable for isolated passages, and differing so greatly that it seems doubtful if they can be credited to the same author; and sev. lyrics, the best, *Meghaduta* (The Cloud Messenger), being very beautiful. *Nalodaya*, a poetical romance, trans. by Rev. W. Yates, 1844, is also ascribed to C.

Calif, see CALIF.

California, Pacific state of the U.S.A. bounded N. by Oregon, E. by Nevada and Arizona, S. by Lower C. (Mexico), and W. by the Pacific Ocean. It lies between parallels 32° 28' and 42° N. lat. It is popularly known as the Golden State, and in the W. it is often spoken of as the Coast. The vast mt. system of C., with the variation it gives of peak and cañon, valley and hill, is one of its most conspicuous features. Two great mt. ranges exist. The Sierra Nevada runs almost parallel with the coast along the E. boundary of the state. Its average

breadth is about 80 m., and it includes about a dozen peaks over 10,000 ft. high. Chief of these is Mt. Whitney (14,898 ft.), the highest in the U.S.A. (excluding Alaska). Among the Sierra Nevada ranges are the rifts of the Yosemite, King's, and Tuolumne, cañons famous throughout the world for their magnificent scenery. Along the coast lies the series of disconnected ranges grouped as the coast range, longer but lower than the Sierra Nevada. Between these two ranges lies the great valley of the Sacramento and the San Joaquin, which two

efforts are being made to preserve them. Timber production is valued at some \$30,000,000 (2,000,000,000 board feet—chiefly pine). There are twenty National forests, which cover over 23,000,000 ac. Of animals, the most characteristic are the grizzly and black bears, the puma, the bighorn sheep, and various varieties of deer. The N. rvs. supply good stores of salmon, and coast fishing is generally important. The geology of the state is fairly simple. The general basis is fairly recent, the Sierra Nevada being chiefly composed of Triassic and Jurassic beds



THE YOSEMITE FALLS, CALIFORNIA

Canadian Pacific

rivs. unite and run into San Francisco Bay. The former, with its trib. the Feather, drains the N. part of the state, the latter drains most of the S. part. Other rvs. are the Eel, Trinity, and Klamath, all in the N. Since C. extends over 770 m. from N. to S., the climatic conditions are varied. The N. dist. is very rainy, particularly in the winter, and the N.W. is damp and foggy. The S., however, is warm and semi-tropical, and has thus become a favourite winter resort. The rainfall is generally low, and the nights are generally cool throughout. On the whole, the climate is one of the best in the world. The flora of C. is very distinct from that of the more easterly states. Among its characteristic products may be named the mammoth *Sequoia gigantea* and the *Sequoia sempervirens*, a species of redwood which flourishes particularly in the N.W. These two species are the only survivors of the genus *Sequoia*, once widely spread over the N. hemisphere, and

the coast ranges are chiefly Cretaceous and Tertiary. The axis of the Sierra Nevada is probably Archæan, and the elevation of the coast range occurred towards the end of the Miocene period. The mineral resources are great, and since the discovery of gold in 1848 the output has been enormous. Lode and placer operations (1941) produce gold valued at nearly \$11,000,000. In 1942 the output of gold was 1,400,000 oz. Other minerals are silver (output about 1,000,000 oz. annually), iron, coal, borax, rock-salt, quicksilver, and copper. The mining of precious stones is increasing in importance. The total of mineral production for 1941 was nearly \$370,000,000. The gradual increase in the number of small owners had given an impetus to C.'s agric. progress. Thirty-five million ac. are under cultivation, and of this about 700,000 ac. consist of vineyards, while on 200,000 ac. cotton is grown. The peach and pear orchards produce important

crops, and all cereals, including wheat, vegetables, fruits, and nuts common to temperate and sub-tropical zones are found in C. The cash income from crops in 1945 was over \$1,250,000,000, while that from live-stock was about \$534,000,000. Abundant irrigation is provided by the numerous streams and unnavigable rivers, and 4,746,600 ac. of land are under irrigation. The output of petroleum is anything up to 250,000,000 barrels annually, but production varies. The Long Beach wells have increased their output by drilling to a depth of 8000 ft. The main industry of C. is petroleum refining. Gasoline or petrol output is about 80,000,000 barrels. Other industries are food canning and meat packing. Los Angeles and San Francisco are very active ports, the exports from the two ports totalling each \$137,000,000 to \$150,000,000 (1941), and the imports between \$80,000,000 and \$90,000,000 each. One of the chief interests in C. is the film industry at Hollywood, Los Angeles. The clear atmosphere allows motion pictures to be taken on all but about ten days in the year. Millions have been invested in the industry, and Hollywood probably makes more films than all the rest of the world. Communication by road and railway is well developed, \$60,000,000 having lately been spent on road construction. Air lines have been estab. The present constitution of C. was adopted in 1880. It was drawn up by the Workingman's party, following the anti-Chinese labour agitations. The state administration is in the hands of a governor elected every four years. Taxes are administered by a board of equalisation. Under the constitution gov. depts. have no measure of autonomy, and any new departure means a revision of the constitution in the form of an amendment. This is known as the C. Idea. There have been sev. amendments. The senate consists of forty members elected for four years, and the assembly of eighty members elected for two years. C. is represented in Congress by two senators and twenty representatives. C. was first discovered by Juan Cabrillo in 1542 and remained under Sp. rule until 1822, when it declared its independence and allegiance to Mexico. It was taken over by the U.S.A. in 1847, and became a state of the Union in 1850. Chief tns.: Los Angeles, 1,504,000; San Francisco, 634,300; Oakland, 302,000; San Diego, 203,000; Long Beach, 164,000; Sacramento, the state capital, 105,000. The gross area of C. is 158,693 sq. m., and the total pop. is estimated at 6,907,000. There are over 90,000 Jap. (of whom 60,000 were born in the U.S.A.), and 40,000 Chinese (over half born in the U.S.A.). See A. Drury, *California: an Intimate Guide*, 1939; J. W. Caughey, *California*, 1940; J. A. B. Scherer, *Thirty-First Star*, 1942; R. E. Cowan, *A Bibliography of the History of California, 1520-1920*, 3 vols., 1943; R. G. Cleland, *From Wilderness to Empire*, 1944.

California, Gulf of, arm of the Pacific which separates the Lower Californian peninsula from the rest of Mexico.

Length is about 700 m., and breadth varies from 50 to 130 m. It was originally known as the Sea of Cortés, after its first explorer. Both shores are bordered by high mts. and the coast-line is very varied. At its N. extremity it receives the Colorado, and various other streams also run into it. On its coasts are the ports of San José, La Paz, Mazatlán, and Guaymas.

California, Lower, 700-m.-long and narrow and drought-cursed peninsula in the Pacific Ocean forming two ters. of Mexico, with an area of 55,629 sq. m. and a pop. of 130,300, is nearly destitute of streams, and for weary months not a drop of rain falls on the parched deserts. But the Boleo copper mines in the N. are one of the chief sources of the world's copper supply, rich deposits of gold have been discovered and a solid mt. of iron and various other minerals. The chief tn., La Paz (pop. 6000), is one of the three greatest pearl-producing centres of the world.

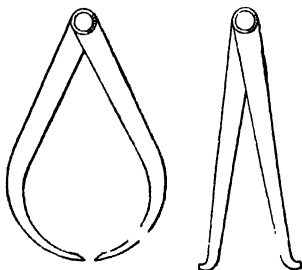
Californian Poppy, genus (*Eschscholzia*) of perennial herbs of the poppy family, native of the valleys of the Sierra Nevada Mts. and grown as an ornamental ann. The name is sometimes given to the *Platystemon*, another genus of *Papaveraceae*, native to California.

California, University of, one of the most important univs. in the U.S.A., opened at Oakland in 1869, but removed to Berkeley, California, in 1873. In this year the College of Medicine was organised in San Francisco, and this, with other San Francisco colleges for law and medical research, were affiliated to the U. of C. Other affiliated institutions are those for agriculture at Davis, for subtropical horticulture at Riverside, and for oceanography at La Jolla. The famous Lick Observatory, Mt. Hamilton, belongs to the univ. There is also a S. branch of the univ. at Los Angeles. Large-scale improvements have been carried out at Berkeley, following a permanent plan for construction, designed in 1896 by Bernard, a Fr. architect. The Gk. theatre, seating 8000 people, was built in 1903. The univ. is co-educational, and has 50,000 students (1947). In addition there are numerous students enrolled under an extension scheme. Tuition is free to all permanent residents of California. Agriculture is the specialised subject most studied, and the research stations at Mt. View, Cortena, and in the Imperial Valley belong to the univ.

Caligula, Gaius Cæsar Augustus Germanicus (A.D. 37-41), was b. at Artium in the year A.D. 12, the son of Germanicus and Agrippina. He was brought up among the soldiers at the camp, and thus became their great favourite, receiving from them the nickname of C., from the soldier's boots (*caligulae*) he used to wear. He was adopted as his grandson by Tiberius, and on the death of that monarch in A.D. 37 it was found that the empire was left to C. and the true grandson of Tiberius. C.'s appointment was hailed with enthusiasm, and the senate and people soon gave him sole power. For a time he gave no sign of carrying out

Tiberius's prophecy that he was educated 'for the destruction of the Rom. people.' He removed taxes, and scattered rewards and indemnities liberally. Then came an illness induced by his evil life, and on recovery from this he seemed possessed by a fury. He slaughtered his own relatives, and filled Rome with blood. His extortions, prodigality, and cruelty were unspeakable. Finally the citizens decided to rid themselves of the tyrant, and he was assassinated.

Calipers, instrument resembling a compass with bent legs, and used for measuring the diameters of various objects. It is used for finding the correct measurement of bores and shafts.



CALIPERS

Caliph, Calit (from the Arabian *kalifa* or *khalifah*, meaning successor), the title given to the civil and religious head of the Muslim states. The name caliphate denotes the rank, dominion, or office of a C. Each C. is supposed to be a direct lineal descendant of Mohammed. There is a tradition which has been wrongfully attributed to him, that there can only be one C. at a time, and should another one be set up, he must be put to death, 'for he is a rebel.' After Mohammed died this title was first borne by a man named Abu-Bekr, who was elected Mohammed's 'representative.' The list of these rulers can be divided into three divs.: (a) The first four Cs., who immediately succeeded Mohammed; (b) the Ommayad Cs.; and (c) the Abbasid Cs. With regard to Abu-Bekr, the first of the Cs. to be elected at Mohammed's death, there was much dissension between the people of Medina, who wished to set up a member of their house, and the emigrants, who set up an opposition claim, and who were successful, as they had brought into Medina many Muslims to terrorise the inhab. Abu-Bekr was the friend and father-in-law of Mohammed, and he proved himself quite capable of dealing with the trouble of the times. He organised an attack on the Gks., but he himself remained behind to defend Medina. When his army came back, he attacked the rebel party; eleven small flying columns were enough to put down the rebellion. The war that had been started by Mohammed against the border countries was an excellent way of

making the religion popular with Arabs, as time was given for looting, and much wealth was gained thereby. In the war that was carried on against the Persians, the Moslems were unsuccessful at first, but at last, at the battle of Kadesia, the Persians were defeated and had to give up part of their land and limit themselves to Iraq proper. The Muslims under Abu-Bekr had soon annexed all the lands bordering on Arabia, and to these they added Egypt. Abu-Bekr d. on Aug. 22, 634, having been in power for only a short time. He was succeeded by Omar, during whose reign there were further tremendous conquests. Omar was a great plunderer, but he paid for his fault by being murdered by a Kufan workman in a mosque in Medina in Nov. 644. Othman succeeded Omar in the caliphate; he was a very weak ruler, and all the gov. of Islam fell into the hands of the Koreish nobility. He was besieged in his own house, where he defended himself for a time, but at last the mob gained an entrance, and put him to death. He was then eighty years of age. After much controversy Ali was elected as successor to Othman. Ali had no right to be elected, having gained his position by ambition and sheer desire for power. His reign was not at all a peaceful one, nor an enjoyable one for him, and he was murdered also, in Jan. 661. After these four Cs. had passed away the Ommayad dynasty arose. Moawiya (661-680) was the first ruler under the new dynasty, which derived its name from one of Moawiya's ancestors. Their seat was Damascus. Many fights and battles took place during his rule. He was essentially a statesman, and he was a religious man as well, as he followed closely the precepts of Islam. None of his successors, however, had either of these virtues. Moawiya's son, Yazid I. (679-683), succeeded. During his reign he committed three actions for which Muslims never pardoned his memory: the murder of Hosain (grandson of the prophet), who had refused to take the oath of allegiance to Yazid, and who had led a revolt of the people of Iraq and sustained defeat and capture at the battle in the plain of Kerbela opposite Kufa (A.D. 680); the pillage of Medina, whose people had espoused the cause of Abdullah ibn Zohair, a rival for the caliphate, who had himself proclaimed C. at Mecca (A.D. 682-83); and the taking of the Ka'aba (Kaaba) (q.v.). Yazid was followed by his eldest son, Moawiya II. (683), a young man of weak character, who d. of the plague or through being poisoned. The choice of a successor then fell on Merwan bin al-Hakam, at Damascus, a descendant of Ommayya, who ruled as Merwan I. After a brief reign spent in unceasing warfare with the Shi'ites, he was suffocated by his wife because he had nominated his own son, Abd al-Melik as his successor instead of her son, Khalid. Abd al-Melik's reign lasted till 705, and a very turbulent; reign it proved to be. He gave the caliphate a coinage of its own, and also gave his patronage to scholars, and urged them to translate Persian works

into Arabic. In the year 692 he levied a capitation tax on all Christian men. This was a means of getting money with which to support his wars. The next C. was Walid I. (705-15), who, though not an active man himself, saw the caliphate greatly extended, going as far as to include Spain on the one side and to the mouth of the Indus on the other. Suleiman I., who d. in 717, was followed by a good ruler, Omar II., but he was poisoned in 720. Yezid II. next succeeded, and d. in 724. Hisham d. in 743. Walid II. was slain in a rebellion in 744. Yezid III. d. also in 744. Ibrahim was dethroned by Merwan II., who was governor of Armenia (745). This was the end of the rule of the Ommayyads. They were not popular, and at last three brothers, descendants of Abbas, an uncle of the prophet, rose in rebellion. The whole land was thrown into a civil war between the white Ommayyads and the black Abbasids. Merwan was pursued into Egypt, and killed in battle in 750. Abdullah, an uncle of the claimants, sent an invitation for a feast to eighty Ommayyads in Damascus, and when they were assembled he slew them all. Thus came the Abbasids into power. Abul Abbas (750-54) was the first C. under the Abbasids' regime. He was called also Saffah, meaning shedder of his enemies' blood. He was followed by Abu Jaafar Almansur, his brother (754-75), who made Bagdad the seat of empire. He left behind him vast riches, but his son, Almahdi (775-85), and his grandson, Alhadi (785-86), spent all vainly. Alhadi's brother, Harun al-Rashid (the Just) came next (786-809). He is best known from the fact of having given his patronage to all orthodox and literary men. He persecuted the Christians, and made eight separate attacks on the Gk. empire in Asia Minor. His three sons fought for supremacy instead of accepting their father's div. of the empire. Amir was defeated and slain in 813, and his brother Almansur succeeded him (813-33). Mutaseen followed his brother (833-42), but with him departed the glory of the caliphate under the Abbasids. He was afraid of his own subjects, so he left Bagdad and went to Samarra, and got together under his leadership about 50,000 Turks, who soon had all the power in their hands. Ever after the Cs. held power and life by the sanction of the Turks.

To support a revolt against the Turks during the First World War, the Brit. Gov. guaranteed to Hussein, Grand Sherief of Mecca, the independence of the Arab countries contingently on a successful revolt against the Turks. Hussein accordingly in 1916 threw in his lot with the Brit. arms, and, after the capture of Mecca and Jiddah, assumed the title of king. This new kingdom, the Hedjaz, was recognised by the post-war treaty with Turkey; and later, in 1924, Hussein, whose ambition had led him to regard himself as monarch of pan-Arabia, assumed the caliphate rendered vacant by the deposition of Sultan Abdul Mejid by

the Turks under Mustapha Kemal. Two years previously the Grand National Assembly of Angora, in abolishing the office of sultan, had decreed that that of C. hitherto vested in the person of the sultan, should be filled by election from among the princes of the house of Osman. But in March 1924, the Assembly decided to abolish also the Turkish Caliphate, and the members of the house of Osman were then expelled from Turkey, while Kemal (see ATATURK) was re-elected president of the Turkish Republic. Consult E. Freeman, *History and Conquests of the Saracens*, 1856; Sir W. Muir, *Annals of the Early Caliphate*, 1883.

Calippus, Gk. astronomer, fl. at the beginning of the fourth century B.C. He rectified the lunar cycle, giving it a duration of sixty-three years, the period being known as the Calippic cycle.

Calixtus, or Callistus, name of three popes:

Calixtus I. (218-22), successor of Zephyrinus. His life is known chiefly from the accounts of Hippolytus, a schismatical adversary of his. This writer says that C. was a slave, denounced as a Christian by the Jews, and later associate of Pope Zephyrinus. Hippolytus accused him of favouring the Patristic views and of lax discipline. The cemetery on the Via Appia bears his name.

Calixtus II. (1119-21), prior to becoming pope was archbishop of Vienne in France. He ruled during the struggles over the investiture question and the schism of the anti-pope. He commenced negotiations on the former question with the Emperor Henry V., and after some trouble matters were settled at the Concordat of Worms, 1122. He defeated the anti-pope, Gregory VIII.

Calixtus III. (1455-58), Alfonso de Borgia, a Spaniard. He preached a crusade against the Turks, who had just taken Constantinople (1453). His chief work was the vindication of the memory of Joan of Arc. The same title, C. III., was also borne by one of the anti-popes, whom Frederick Barbarossa, the emperor, set up in 1168 in opposition to Alexander III.

Calixtus, Georg, properly Callisen (1886-1856), Ger. Protestant theologian, was b. at Medelbye in Schleswig. In 1813 he became prof. of theology at Helmstedt, and was engaged in keen controversy with the Rom. Catholics. His study of the first centuries inclined him to toleration, and his advocacy of this brought him into some suspicion. His chief work is an *Eyntome theologia moralis*, (1834).

Calla, genus of Araceae with the single species, *C. palustris*, bog arum, found in marshes of N. Europe. The leaves are cordate, not sagittate, and the hermaphrodite flowers, borne every two years, are enveloped in a beautiful white spathe. *Richardia* or *Zantedeschia aethiopica*, the Egyptian lily, or lily of the Nile, commonly known as the C. or C. lily, was formerly included in this genus.

Callaghan, Sir George Astley (1852-1920), Brit. admiral. Entered the navy,

1865, and by 1894 had reached the position of naval adviser to the inspector-general of fortifications. In 1900 he commanded the *Endymion* in Chinese waters, taking part in the suppression of the Boxer rebellion. Also fought at Taku and later commanded the naval brigade which co-operated in the relief of the Peking legations. Promoted rear-admiral in the Channel Fleet when the 'Dreadnought' type was introduced, and in 1911 became commander-in-chief, which post he held till the outbreak of the First World War, when he was succeeded

is mentioned as the 'gate of the Highlands.' The shapely peak of Ben Ledi (2875 ft.) rises to the N.W. of the tn. Being thus romantically situated, it has become a centre for tourists, and large hotels and hydropathic estabs. have been built. There are sev. churches, including an Episcopal. Pop. 2400.

Callanish, see CALLERNISH.

Callao, tn. and chief seaport of Peru, 6 m. S.W. of Lima, the cap. It is situated on C. Bay, where it is sheltered from storms by the is. of San Lorenzo. It has a floating dock, fine harbour walls, and



THE STANDING STONES OF CALLERNISH

Viola Banks

by Adm. Jellicoe. It was due largely to his recognised skill in training organisation that the Home fleet was in so high a state of efficiency when he retired.

Callahan, James Morton (b. 1864), prof. of hist. and political science at W. Virginia Univ. Head of the dept. of hist. and political science, W. Virginia Univ., 1902; dean, College of Arts and Sciences, same univ., 1916. Among his works are *Neutrality of the American Lakes* (1898); *Diplomatic History of the Southern Confederacy* (1900); *American Relations in the Pacific and the Far East* (1901); *The American Expansion Policy* (1903); *Semi-centennial History of West Virginia* (1914); *History of West Virginia, Old and New* (1933).

Callais, see TURQUOISE.

Callan, tn. of Kilkenny, Eire, 8 m. S.W. of Kilkenny; pop. about 2000.

Callander, mrkt. tn. and bor. of Perthshire, Scotland, situated on the R. Teith, about 16 m. N.W. of Stirling. It is in close proximity to the Trossachs, and

narrow streets of shabby appearance. It has gasworks, sugar refineries, iron-works, etc., and its chief exports are minerals, sugar, hides, wool, etc. Almost all the world's supply of vanadium, used in making motor axles and aeroplanes, is exported from C. The present tn. dates only from 1746, when the old city was destroyed by a great earthquake. It has suffered considerably from bombardments by Sp. and Chilean navies. Pop. (dept.) 82,000, (city) (1936) 75,000.

Callcott, Sir Augustus Wall (1779-1844), Eng. landscape painter, was b. at Kensington. He early studied music and was for sev. years a chorister at Westminster Abbey. In 1799 he determined to devote himself entirely to painting, and exhibited for the first time at the Royal Academy. In 1806 he became A.R.A., and in 1810 received his R.A. In 1837 he received knighthood. His best works are landscapes, and these are remarkable for their clearness and delicacy. But his largest work is 'Raphael and the Fornarina.'

Callendar, Hugh Longbourne (b. 1865), Eng. physicist. Educated at Marlborough and Cambridge Univ. Was prof. of physics at McGill Univ., Canada, 1893-98, at Univ. College, London, 1898-1902; and later at the Imperial College of Science. He has carried out much research work in thermodynamics, notably in calorimetry. His *Callendar Steam Tables* (1915) and *Properties of Steam and Thermodynamic Theory* (1921) give the results of his researches on steam.

Callernish, or Callanish, dist. and vil. on Lewis Is., Ross-shire, Scotland, on the E. coast of Loch Roag, 16 m. W. of Stornoway. The standing stones of C. in the form of a cross with a circle in the centre are among the finest in Britain. Pop. about 500. (See illustration, p. 139.)

Calles, Plutarco Elias (b. 1887), Mexican military leader and statesman, b. at Guaymas, Sonora, Mexico. Joined in the rebellion against the rule of the tyrant-president, Porfirio Díaz. His life for a large number of years after that was that of a military man. He was on the side of Carranza (q.v.) in the latter's fight with Huerta (q.v.), reaching the rank of a general. In 1915 he campaigned with Gen. Obregón (q.v.) against Pancho Villa. In 1917 he was made governor of his native state of Sonora. After holding Cabinet posts under Carranza and Obregón he was elected president of the Mexican republic for a four-year term, beginning in 1924. His administration was marked by very stormy times. The oil-land laws brought a conflict with the big Amer. petroleum companies, and the laws for separation of Church and State resulted in a conflict with the Rom. Catholic Church.

Callianassa, genus of decapod crustaceans, and is the type of the family Callinassidae. They are noted for the inequality in size and form of the chelae, or claws. *C. subterranea*, the commonest species, is found at Naples and on Fr. and Eng. shores.

Callias, name borne alternately with Hipponicus, by the heads of a powerful Athenian family which produced many distinguished citizens. The best known of these, surnamed Cacoplitus (beginning of fifth century B.C.), was reckoned as the richest Athenian of his time. He is said to have slain a Persian at Marathon who revealed to him the hiding-place of a vast treasure. Legend also tells that in 469 B.C. he was one of the ambas. sent by the Athenians to Artaxerxes, and that he arranged the peace of C. The name 'peace of C.' was also given to the peace between Athens and Sparta negotiated by a later C. in 371.

Callicera, generic name of certain dipterous insects of the family Syrphidae. They are stoutish flies with large heads and eyes, the body is silky, and the antennae form elongated and slightly curved clubs.

Calliophora, genus of Coleoptera of the family Cerambycidae, or longicorns. It differs from allied beetles in having the whorl-gillary palpi smaller than the labial, the shorter than the terminal lobe of the antennae. It emits a very agreeable odour.

Calliothrix, genus of malacoapterygous

fishes belonging to the Siluridae, or catfish family. The body and head are protected by large, hard, scaly plates, only the snout and under surface being naked, and barbels depend from the mouth. The species frequent rivers and streams in hot climates, and when the water dries up they perform journeys overland in quest of new ponds.

Calliocrates, Gk. architect who, with Ictinus, planned the celebrated Parthenon, which is the magnificent temple erected in honour of the virgin goddess Athene in the year 438 B.C. It is the finest example of Gk. architecture still extant.

Callieratidas, Spartan general, was sent in the year 406 B.C. to take Lysander's place as commandant of the fleet, towards the end of the Peloponnesian war. He pursued Conon, and defeated him in the harbour of Mytilene. Conon took refuge here, and held out till the Athenians sent a large force to his relief. C. was then defeated and slain in the naval battle of Arginusae. C. was greatly hampered in his efforts for efficiency by the incapacity of his predecessors.

Callidium, genus of coleopterous insects of the Cerambycidae, or longicorns. *C. bagulus* is a Brit. species, about three-quarters of an inch long, of dull black colour, and is very destructive to fir-trees.

Calligonum, genus of Polygonaceae which consists of about twenty species from Africa and Asia. *C. Palsia* yields a nutritious gum, which is obtained from the root, and a beverage is made from the fruit.

Calligraphy, art of fine handwriting. See WRITING.

Callimachus, Athenian sculptor, who fl. in the fifth century B.C. He was possibly a disciple of Calamis, and the great characteristic of his work was over-minuteness. He is supposed to have invented the Corinthian capital, and also to have been the first to employ the running borer for drilling marble. Among other decorations furnished by him for the Erechtheum was a famous golden lamp.

Callimachus (c. 310-c. 240 B.C.), Gk. grammarian, critic, and poet, b. at Cyrene of the distinguished family of the Batliadae. He founded a school at Alexandria, where he had Aristophanes of Byzantium and Apollonius of Rhodes among his distinguished pupils. He was a favourite of both Ptolemy Philadelphus and of his successor, Ptolemy Euergetes. He became chief librarian of the Alexandrian library under the former, and held this office till his death. In his *Pinakes* (tablets) he gives a catalogue of the books in the library, with a short criticism and account of the writers. This laid the foundation of the critical study of Gk. He is said to have written some 800 works, but of these only six hymns and sixty-four epigrams remain entire. His elegy, *Berenice's Lock*, is known to us in the trans. of Catullus. Some fragments of his epic *Heleae* have been found, but his *Aitia* is quite lost. It dealt with the foundation of cities, religious customs, etc. The best eds. of hymns and epigrams are those of Meineke (1861) and Wilamowitz

(1883). See also Eng. version with Gk. text in the Loeb series (U.S.A.).

Callimorpha, genus of Lepidoptera of the family Arctiidae; it includes sev. beautiful night-flying moths. The body is small and the wings large, somewhat triangular, and the hinder margins are rounded. *C. Jacobææ*, the pink underwing, is a common example.

Callington, mkt. tn., Cornwall, England, 10 m. from Launceston. It has extensive quarries, granite from which was used for the construction of the Thames Embankment, and Blackfriars and Battersea bridges, London. Pop. 1600.

Callionymus, technical name of the acanthopterygious fishes known popularly as dragonets, genus of Gobiidae, or goby family. The gill openings are reduced to a single small hole near the nape of the neck, the ventral fins are under the throat, the fin-rays of mature males are produced into filaments, and the body is smooth and without scales. *C. draco*, the sculpin, is about 10 in. long, and is brown and white in colour; *C. lyra*, the gemmeous dragonet, is another Brit. species, and is yellow, sapphire, and violet in hue.

Calliope, first of the nine muses and the mother of Orpheus. She is the muse of epic poetry, and is generally depicted with a tablet and a pencil.

Callirrhoe, na. to C. a famous fountain in Athens, and formed one of the chief water supplies to that tn. According to Gk. legend C. was the daughter of Achelous, the riv. god.

Callisen, Georg, see CALIXTUS.

Callisthenes (c. 360-328 B.C.), of Olynthus, Gk. philosopher and historian, kinsman and pupil of Aristotle, accompanied Alexander the Great into Asia. He was put to death on account of his remonstrances against Alexander's oriental luxury and assumption of divine origin. He is credited with an account of Alexander's expedition and a hist. of the Phocian war, but the life of Alexander, once ascribed to him, is certainly spurious. The romance of Alexander in its different versions is derived directly or indirectly from the Gk. original which went under the false name of C. and this original was the foundation of the legends of Alexander circulated in the Middle Ages. This romantic life seems to date from the era of the Ptolemies and its author, called the pseudo-Callisthenes, otherwise Aisopos, has been variously identified—but without much evidence—with Aristotle, Antisthenes, and others.

Callisthenes, light gymnastic exercises for health and the development of the body. See GYMNASTICS.

Callistratus: 1. Rom. jurist, who lived in the reigns of Septimius Severus and Caracalla. He is said to have been a pupil of Papinian. None of his writings is extant, but some of his works are the source of the *Digest* of Justinian, in which some extracts from him are given. 2. Athenian orator of the fourth century B.C. whose eloquence is reputed to have inspired Demosthenes with a love of oratory. He was both a general and a statesman, but was ultimately exiled to Thrace,

where he founded the city of Datum. Later he returned to Athens and was executed. 3. Gk. grammarian of the second century B.C., author of commentaries on the chief Gk. poets. He is said to have been the first to introduce the twenty-four-letter alphabet to the Samians. 4. Gk. rhetorician of the third century B.C., author of descriptions of fourteen statues by famous artists.

Callitricheaceæ, very small order of dicotyledonous plants, consisting of about twenty-five species, all contained in the single genus *Callitriche*. They are nearly all floating plants, and are cosmopolitan but for S. Africa; in Britain they are known as water starwort. The flowers are unisexual and devoid of all floral covering, the male flower being simply a single stamen and the female a bilocular, spuriously quadricellular, ovary with two styles. In *C. vernalis* (*C. palustris* (Linnaeus)) pollination takes place in the air, in *C. autumnalis* under water.

Callosities, bare patches of skin where the epidermis has thickened into a horny substance. This thickening is due to pressure, friction, or chemical irritation continued for a lengthy period. They are more frequently found in mammals, and they are especially conspicuous in camels and on the inner side of the legs of horses. In the human being C., or corns, are generally situated on any prominence such as a joint, but they also appear on any part of the integument and are often formed on the soles of the feet. In appearance the skin takes on a yellowish colour, is smooth and horn-like, and is thickest in the centre.

Callot, Jacques (1593-1635), Fr. painter and engraver, was b. at Nancy in Lorraine. At the age of twelve he ran away from home, intending to seek Rome and devote himself to art. He joined a band of gipsies, and later the suite of a nobleman. He was then found, however, and taken home. Once again he escaped and was brought back, and then his parents gave way, and sent him to Rome with the duke of Lorraine's ambas. For some time he painted in Florence, but quitted this tn. to return to his prince. He visited the Low Countries to gather the material for his 'Siege of Breda,' and later Louis XIII. of France engaged him to engrave other war pictures, among which is the 'Siege of La Rochelle.' C., the great painter of manners, has left a vast number of engravings. He was rapid and impatient in his work, and all his engravings are marked by vigour and animation. His 'Gipsy Hail' and 'Miseries of War' are particularly remarkable in this respect.

Calluna vulgaris constitutes in itself a genus of Ericaceæ, and is known as ling or heather; it flourishes on every heath of Britain, and is common in N. America and Europe. The plant is a low-tufted shrub, with small, sessile, closely imbricated leaves, flowers varying in colour from deep red to white, and fruit a septical capsule.

Callus, substance given off round the fractured ends of a bone forming a new bone which unites the breakage. A

similar process takes place in plants when a cutting is taken or a branch pruned. When a plant is damaged a succulent tissue exudes and covers up the cut surface. In cuttings this C. produces the roots of the young plants.

Calmar, see KALMAR.

Calmet, Augustin (1672-1757), learned Fr. Benedictine monk, was b. at Mesnil-la-Horgne, near Commercy (Meuse). He entered the Benedictine order in 1689. In 1719 he was appointed abbot of St. Léopold at Nancy, and ten years later was transferred to the abbey of Sonones. His chief work is the *Histoire ecclésiastique et civile de la Lorraine* (1728), characterised by great learning and research. His *Dictionnaire historique, géographique, chronologique et littéraire de la Bible*, 4 vols. (1722-28), is one of the first works of its kind. Another important production is the *Commentaire sur tous les livres de l'Ancien et du Nouveau Testament*, 23 vols. (1707-16). Life by Dom Fangé, 1763.

Calmette, Gaston (1858-1914), Fr. journalist; b. July 30, at Montpellier. Educated at Lycées of Brét, Bordeaux, Clermont-Ferrand, and Mâcon. He joined the staff of the *Figaro* in 1880, was secretary of editorial board 1894-1903, thenceforward editor-in-chief. A chevalier of the Legion of Honour, he acquired riches and strong enmity through the *Figaro*, for Chauchard, who had been prin. shareholder, left him a large part on his wealth; and he was unhesitating in his attacks on personal character. When editor of the *Figaro*, he threatened to publish letters which would have compromised Mme Caillaux (see CAILLAUX). His assassination by Mme Caillaux at his office on March 16 was the social sensation of the year 1914. Mme Caillaux was arrested but, after a trial characterised by many remarkable incidents, was acquitted.

Calmette, Léon Charles Albert (1863-1933), Fr. bacteriologist, b. at Nice, brother of Gaston C. (q.v.). Became a director of the Pasteur Institute and one of the leaders of medical research in France. Spent most of his life in the study of tuberculosis, his researches eventuating in the introduction of the bacillus C. Guérin, which proved successful in the treatment of tubercular children.

Calms, The, regions of calm weather at sea, just N. of the equator, on the confines of the trade winds. They last for many weeks at a time. Also known as the doldrums.

Calmucks, see KALMUCKS.

Calne, mkt. tn. of Wiltshire, England, 5 m. E.S.E. of Chippenham. It has a large bacon-curing industry, and manufs. of flour and paper. In 978, at a synod held here, the floor gave way, precipitating all but St. Dunstan to the ground. Pop. 4000.

Calochortus, Mariposa Lily, or Star Tulip. A genus of Amer. Liliaceæ, nearly allied to the fritillary and tulip; the fruit is a septicidal capsule. The plants are abundant in California, but do not grow well in England unless their roots

are carefully protected from frost and excessive water, and can be exposed freely to light and air when growing. *C. albus* is a white and *C. lilacinus* a lilac-coloured species.

Calomel, popular and medical name for mercurous chloride, Hg₂Cl₂. This substance is found in nature as horn mercury or horn quicksilver, a sectile tetragonal mineral of hardness 1 to 2 and sp. gr. 6.48. C. is prepared in the laboratory by adding mercury to sulphate of mercury and triturating the whole in a mortar, afterwards adding common salt and subliming the mixture. Any corrosive sublimate which passes over is renewed by washing with hot water. A more convenient method is adding mercury to corrosive sublimate (mercuric chloride) and subliming. C. is a dense, white, odourless powder, insoluble in water; it turns black when treated with lime-water, potash, soda, or ammonia. When heated it vaporises without charring and sublimes again unaltered. It is the most widely used preparation of mercury in medicine, producing its effects without much local inflammation. In small doses it is used to relieve congestion of any part of the alimentary system, as it gently stimulates secretion, and thus helps to 'clear the system' in cases where increased functional activity is required to counteract the effects of overfeeding, unaccustomed lack of exercise, etc. In larger doses it is used by adults as a purgative, and generally as an alterative, as it is often efficacious in restoring the normal activity of any organ after it has been deranged through any cause. C. is not so poisonous as the more soluble mercuric salts, but the absorption of the mercury in great quantity, as in the syphilis cure, may give rise to poisoning characterised by a coppery taste in the mouth, loosening of the teeth, and in the severer cases, by emaciation, necrosis of the jaws, and neuritis.

Calonne, Charles Alexandre de (1734-1802), Fr. statesman, was b. at Douay. He entered the legal profession, and after having filled various offices, became in 1783 comptroller-general of the Treasury. He found the deficit already large, and in a short time he had managed to increase it much more by borrowing in all directions. Finding at last that it was impossible to continue, he persuaded Louis XVI. to call an assembly of the 'notables,' to whom he proposed that their privileges should be abolished. This was not well received, and he was compelled to resign. He spent some years in England, but returned to die in France.

Calophyllum, genus of trees belonging to the Guttifereæ, is noted for the beautiful colour of its young leaves. The species grow in tropical countries, chiefly of the Old World. *C. inophyllum*, a native of the E. Indies, attains a height of 100 ft., and has large leaves like those of a water-lily, snow-white fragrant flowers, and a nut which yields an oil useful for burning in lamps. *C. lacamahaca* yields the resin which is known as *tacamahac*. *C. Calaba*, the calaba-tree, grows in the Caribbee Is.

and is noted for its white, sweet-scented flowers, green fruit with an oily seed, and timber which is used in making staves and oak-headings.

Calorescence, name given by Prof. Tyndall to the production of light from the invisible rays beyond the red end of the spectrum (*q.v.*). These rays are the hottest, and magnesium can be burned and platinum brought to white heat by them. The action of the platinum renders the rays visible, whence the description 'calorescent.'

Caloric Theory, now discarded theory of heat, which postulated a fluid 'caloric' of no weight, the presence of which rendered a body hot. It was believed that 'caloric' flowed from a hot to a cold body in contact with each other. The theory was replaced by the kinetic or dynamic theory, following the researches of Benjamin Thomson in 1798.

Calorie, unit quantity of heat. The 'small C.' is the amount of heat required to raise the temp. of 1 gm. of water 1° C. As the specific heat of water varies slightly with its temp., the temp. is usually specified, as from 0° to 1°, or from 15° to 16°. The latter temp. has the advantage that the C. so measured is almost equal to the 'mean C.' obtained by dividing the amount of heat required to raise 1 gm. of water from 0° to 100° by 100. The 'great C.' is the amount of heat required to raise 1 kg. of water 1° C. It is therefore equal to 1000 small Cs., and is approximately equivalent to 3.968 Brit. thermal units. For the use of the term in reference to human energy see DIET and FOODS AND FEEDING.

Calorimeter (Fr. *calorimètre*, from Lat. *calor*, heat, and *metrum*, derived from Gk. *μέτρον*, measure), apparatus used to measure quantities of heat developed or absorbed in different chemical and physical changes, *e.g.* heat developed by friction, combustion, etc.; or absorbed as by melting ice. Cs. vary in form according to the purposes they serve. The simplest variety, a plain metal vessel, is that used to determine the specific heat of metals. In the ice-C. the heat is measured by the amount of ice which it melts. More complex forms are used to determine the specific heat of gases. In these experiments many contrivances, such as vacuum jackets, non-conducting air jackets, are used to prevent loss of heat, which is the greatest difficulty to overcome. See SPECIFIC HEAT and THERMOCHEMISTRY.

Calosoma, genus of coleopterous insects, is included in the family Carabidae. They greatly resemble the genus *Carabus*, and *C. synophanta* is one of the largest and most beautiful species of its family.

Calotropis, genus of Asclepiadaceae common to the tropics of Asia and Africa. *C. gigantea*, the madar, mudar, wara, or bow-string hemp, grows in sandy places in many parts of India, and is noted for its milky juice, which is used medicinally in the E.; for the fibre made from the bark and the floss obtained from the seeds, *C. procera* is known as Fr. cotton or Fr. jasmine.

Calottistes, satirical society founded by Aymon and Torsac, two of Louis XIV.'s bodyguard, in 1702. It derived its name from *calotte*, the small cap that the priests wore to hide their tonsure. In the middle of the eighteenth century it was converted into a military institution, but it was finally crushed out of existence at the time of the revolution.

Calotype, process of photography invented in 1811 by Fox Talbot, whereby paper sensitised with silver oxide, exposed in a camera, and developed with gallic acid, resulted in the image being a negative, *i.e.* reversed as regards light and shade.

Calovius, Abraham (1612-86). Ger. Lutheran divine, who was b. on April 16, at Mohrungen in Prussia. He studied at Königsberg, and in 1650 he gained the position of prof. of theology at Wittenberg, where he later on became general superintendent and primarius. He was the most ardent upholder of Lutheran doctrines during the seventeenth century. He strenuously fought against Catholics, Calvinists, and Socinians, and he was particularly opposed to the reconciliation policy, or 'syncretism,' of Georg Calixtus. As a polemical writer he had few rivals. His prin. work was *Systema locorum theologicorum*, written between the years 1655 and 1677, and which runs into 12 vols. His book, *Historia Syncretistica*, written in 1682, was suppressed.

Caloyers, Gk. monks; very strict religious order divided into three ranks, and following the rule of St. Basil. Bishops, patriarchs, and theologians are chosen from this order because the monks are of high social rank for the most part. Many monasteries exist, the most celebrated being that of Mt. Sinai.

Calpe, anc. name of Gibraltar. C. was the name of a mt. in the S. of Spain between the Mediterranean and Atlantic; opposite to it on the African coast was Mt. Abyla, the two being called the *Columns (or Pillars) of Hercules*.

Calpee, see KALPI.

Calprenède, Gautier de Costes de La, see LA CALPRENÈDE.

Calpurnia, last wife of Julius Caesar. He married her in 59 B.C. She has been immortalised by Shakespeare through his representation of her anxiety and superstitious dread at the time of the conspiracy against her husband by Brutus and his colleagues at the Ides of March.

Calpurnius, Titus Julius (Titus Calpurnius Siculus), Lat. poet; wrote early in the reign of Nero. Chiefly remembered for his *Ecloques*, in which he assumes the name of Corydon. He ultimately found a patron in Melibœus, whose identity is not fixed—possibly Seneca. Corydon, in one of his idylls, gives thanks to Melibœus for his bounty and asks him to bring the poem in question to the notice of the emperor. But Melibœus is also thought to represent C. Calpurnius Piso, the noble who was afterwards involved in a conspiracy against Nero. If this be so, the poet himself may have his name, Calpurnius, to the fact that he was a son of one of Piso's freedmen. His other name, Siculus, is probably owed to the character of his

idylls. C. is in no way original, but 'a skilful literary craftsman.' Some four of the eleven *Eclogues* ascribed to him are now generally attributed to Nemesianus (q.v.). Like Virgil C. enlivens his pastorals by allusions to contemporary events and persons, and all his seven idylls are closely imitated from Virgil; but C. has not Virgil's great love of country, and his hexameters, if impeccable in following the metrical usage of bucolic verse, are monotonous. The most striking of his idylls is, perhaps, the last, in which, as in the first of Virgil's eclogues, a shepherd describes a visit to the cap. The long Lat. hexameter poem, *Ætna*, once ascribed to Virgil, has also been attributed to C., as being a poet who was familiar with the *Ænid*.

plateau almost in the centre of the is., and is 43 m. N.E. of Girgenti. It has a cathedral, technical and mining schools, sulphur mines, mineral springs, and potteries. Near by is a Norman monastery built by King Roger in 1153. In the Second World War the W. portion of the roof of the nave and the vault of the cathedral with frescoes by Borremans were destroyed. The church of San Giovanni was completely destroyed. Pop. 50,500.

Caltha, genus of Ranunculaceæ, which flourishes in temperate countries and is represented in Britain by *C. palustris*, the marsh marigold. The flowers are radially symmetrical, have no petals, but usually five petaloid stamens, and the fruit is an eterio of follicles.



MOUNT CALVARY

Calshot, headland of Hampshire, England, at the W. extremity of Southampton Water. Is now an important seaplane base.

Calstock, par. and mining tn., E. Cornwall, England, on the Tamar. Pop. 4400.

Caltabellotta, tn. in the prov. of Girgenti in Sicily, near the site of the anc. Tricala, and situated 9 m. N.E. of Sciacca. Originally a Saracen fortress. Pop. 7100.

Caltagirone, tn. and episcopal see in Catania in Sicily. It is a well-built tn., and situated on the tops of two hills (1930 ft.), and these are connected by a bridge. It is a residential place for the nobility of the is., and is famous for its schools and also for its pottery. The church of S. Giacomo was damaged in the Second World War. Pop. 40,000.

Caltanissetta: 1. Prov. of Italy in the middle of Sicily. It rises to a height of 3000 ft. in the N., and is drained by the Salso and other small riva. Its chief products are sulphur, wheat, wine, salt, olives, and other fruits. Area 1263 sq. m. Pop. 265,000. 2. Cap. of the above prov. It is a bishop's see, and stands on a lofty

Calton Hill, hill overlooking Edinburgh city from the E. It is 355 ft. high and on its summit is the National Monument.

Caltrop (*A.-S. calca-træppe*), small iron ball covered with projecting spikes. They were much used in the warfare of the Middle Ages. When an enemy was expected, the ground over which it was to travel was thickly strewn with these balls. The result was disastrous to the horses as well as to the barefooted infantry. Cs. were also used by the colonists in New England. They placed them among the grass as a defence against the assaults of the Indians. The word is also applied to plants that catch the feet, the 'water Cs.' being the name of the *Potamogeton* because it entangles swimmers.

Calumba Root, or *Radix Calumba*, is obtained from the climbing herbaceous plant, *Jalorhiza palmata*, a species of Menispermaceæ occurring in tropical Africa. The odour is faintly aromatic, the taste bitter and slightly acid, and the bitter active principle is known as calumbine. It is used medicinally as a tonic and stomachic.

Calumet, tobacco pipe known among Amer. Indians as the peace pipe. This was always handed round at an assembly of warriors at the conclusion of peace negotiations. In these days it is offered to strangers as a mark of hospitality. Dire offence would be taken should they decline to smoke it. The pipe has a stem of wood 2½ ft. in length, with a stone bowl, and is ornamented with women's hair or eagles' feathers.

Calvados, in Normandy, a maritime dept. in the N. of France, and called by that name after one of the vessels of the Sp. Armada, which was shipwrecked off a dangerous ledge of rocks in 1588. The coast is dangerous on account of the rocks, and lighthouses are placed at the mouths of the Rs. Touques, Dives, Orne, and Vire. The region is mountainous with extensive fertile valleys. The pasturage is good, and there is an abundant supply of wheat and agric. produce. Cider is produced in great quantities from the orchards in the Auge dist.; a spirituous distillation of cider is made also and bears the name of the dept. There are six arrons., named respectively after the chief tns., Caen, Vire, Bayeux, Lisieux, Falaise, and Pont l'Évêque. The prin. ports are Caen, Trouville, and Honfleur, and there is an excellent fishing industry. For the battles of C. in 1944 see under WESTERN FRONT in SECOND WORLD WAR—*Battle of Normandy*. Pop. 405,000.

Calvary. The word C. or Calvaria is a translation of the Heb. word Golgotha, a skull, and it is conjectured by some authorities that this name was given to the spot on which our Lord was crucified because of the skull-like appearance of the mt. ridge; others attribute its name to the fact that this place was the scene of public executions. Mt. C. is situated outside the city of Jerusalem and lies to the N.W. The site of C., like that of the Holy Sepulchre, had not disappeared by the beginning of the fourth century, and for some ten years from A.D. 325 Constantine lavished the skill of builders and treasure on giving to these sites an ambitious architectural covering. Rom. Catholics have commemorated this event in some foreign cities by giving a representation in sculpture of the scene on C.

Calvé, Emma (Rose Emma Calvet) (1864-1942), Fr. opera singer, b. at Decazeville, Aveyron. Her father took the family to Spain and Sp. became her first language, but she was educated at a Fr. convent. Studied music under Jules Puget in Paris and, after she had made her first important appearance, which was at Brussels, 1882, as Marguerite in *Faust*, she became a pupil of Mme Marchesi. She had a great range and could sing both *Hérodiade* and *Salomé*, contralto and soprano, in Massenet's *Hérodiade*. Appeared at Covent Garden in 1892 as Santuzza in *Caratteria Rusticana*, her success, both in that part and as Carmen in Bizet's opera, being immediate. It is generally agreed that she was the greatest of all Carmens. Other roles were Anita in Massenet's *Navarraise*, Sapho in the same composer's opera of that name, and

Mossaline in Isidore de Lara's opera. She made a great impression as *Salomé* in a revival of Massenet's *Hérodiade*, given at Covent Garden in 1904 as *Salomé*. Strictly her voice was a mezzo-soprano and through all the registers there was a timbre of remarkable beauty and individuality. Purchased the château of Cabrières, which became the home of her retirement, and there she founded and maintained a sanatorium for young girls.

Calveley, Sir Hugh (d. 1393), Eng. soldier. He fought in Brittany in the war of 1341-61, during which he was imprisoned at Josselin. He took part in the battle of Auray (1364), which ended the war. C. was a freelance and fought for which ever leader pleased him. In 1367 he left Henry of Trastamare and served the Black Prince, and fought under Sir John Chandos at the battle of Navarrete (1367). He became deputy-governor of Calais (1377-79) and of Brest (1380). He is said to have been one of the founders of a college in Rome (1380), and in 1385 founded one at Bunbury in Cheshire.

Calverley, Charles Stuart (1831-84), Eng. poet. A son of Rev. H. Blaydes, he adopted the name of C. Educated at Harrow, and at Oxford and Cambridge. At the latter he proved himself a fine scholar, a fact evidenced by his *Translations into English and Latin* (1866), and *Theocritus translated into English Verse* (1869). Full of exquisite humour and wit are his *Verses and Translations* (1862), and *Fly Leaves* (1872). A brilliant man, but unhappily suffering from ill health, he wrote only short pieces, some of which have secured him his high reputation. As a parodist he was delightful, and there are some who assert that he is the best writer of parodies in verse in the language.

Calvert, Mrs. Charles (1836-1921), distinguished Eng. actress, daughter of James Riddles, an actor. Played as a child actress at the age of seven with Charles Kean and wife. Became leading lady at the Theatre Royal, Southampton, in her teens; also acted at the Boston Theatre, U.S.A. During her husband's tenure of the Prince's Theatre, Manchester, she built up a considerable reputation in such Shakespearean parts as Cleopatra, Hermione, Miranda, Catherine of Aragon—with Phelps as the cardinal—and many others. Also successful in modern comedy, notably as Catherine Petkoff in Mr. Shaw's *Arms and the Man*, and as Mrs. Harcourt.

Calvert, Denis (1555-1619), Flemish painter, who studied first in Antwerp; thence he went to Bologna and Rome; after studying Raphael's works, and assisting Lorenzo Sabatini with paintings for the ducal palace, he returned to Bologna, where he founded a school which Domenichino and Guido both attended.

Calvert, Edward (c. 1803-83), Eng. painter and draughtsman, b. in Cornwall, son of a naval officer. Was a midshipman, but left the service to study the arts. Attended the Royal Academy schools and studied painting under John, a W. country artist. Began work in London as an illustrated draughtsman upon wood,

but impressions from his blocks are rare, because in his diffidence he destroyed most of them. Paintings exhibited at the Royal Academy were 'Nymphs,' 'A Shepherdess' (1827); 'Morning' (1829); a picture illustrating Milton's 'Eve' (1936). He produced a number of woodcuts and plates of considerable beauty, the most notable being the 'Christian Ploughing the last Furrow of Life' and the 'Cider Press,' both of which show the influence of Wm. Blake, whom he worshipped and whose acquaintance he made early in his career.

Calvert, Frederick Crace (1819-73), Eng. chemist, who was b. in London, but all his scientific education he received in France. His celebrity was gained from his researches into the industrial side of chem., tanning, calico-printing, and iron-puddling. He was the first person to manuf. pure carbolic acid, and he was the founder of extensive works in Manchester for its production. It may also be said that he made the first use of it as a disinfectant. He also pub. a book called *Dyeing and Calico-printing* (2nd ed. 1876).

Calvert, George (c. 1580-1632), first Baron Baltimore, Eng. statesman and founder of the state of Maryland, in U.S.A. For some time he was secretary of state to James I., but being a Rom. Catholic was forced to resign. He retained the king's favour, however, and was granted land in N. America. He d. before the charter was completed, but it passed to his son Cecil.

Calvert, Louis (1859-1923), Eng. actor, son of an actor. Well known in Shakespearean parts, particularly as Falstaff in *Henry IV.* He was equally successful in many Shavian parts, his technique and flair for character being remarkable. Pub. *Problem of the Actor* (1919).

Calvert, Thomas (1775-1840), theologian, b. at Preston. He became tutor of St. John's Cambridge, 1814; Norrisian prof. of divinity, 1815-24; Lady Margaret's preacher, 1819-24. He was appointed king's preacher at Whitehall, and in 1822 was given the wardenship of the collegiate church at Manchester. See *Raines, Lives of the Wardens of Manchester*, 1885.

Calvi, fort. tn. and harbour on the N.W. coast of Corsica, and 45 m. N. of Ajaccio. The citadel was captured by the Eng. in 1794 at the time Nelson lost his eye. Some trade in wine, oil, and fruits is carried on, and it is a fishing centre. Pop. 2600.

Calvin, John (1509-64), was b. at Noyon in Picardy. His name is the Latinised form of Chauvin or Cauvin. His father, Gérard Chauvin, was notary apostolic and procurator fiscal of the co. of Noyon, and intended his son for the Church. In 1521 C. received a chaplaincy in the cathedral of Noyon, and a few days later he was made curé of Marteville. During this time he was engaged in study at Paris in the colleges of Marche and Montaigu. It was then that he resolved not to take orders, and went to Orleans to study law. Here he found Pierre Olivétan, a kinsman of his, who was then busy translating some of the Scriptures, and who induced

the young student to study them with him. Thence C. went to Bourges, where he came under the influence of the famous Gk. scholar, Melchior Wolmar (or Volmar) who further influenced him in the direction of the reformed faith, though his conversion does not yet seem to have been definite. His residence at Bourges was cut short by the sudden death of his father. He paid a hurried visit to Paris and then returned to Noyon, where he lived for two years. From 1529 to 1532 he apparently resided in Paris, lodging with a tradesman, Étienne de la Forge, who early fell a victim to his zeal for the Reformation and whom C. accounted as a 'holy martyr blessed among believers.' In Paris he began to speak freely against the Rom. Church and its faith. Forewarned of an attempt to arrest him, C. retired first to a castle near Mantes, then to Saintonge and afterwards to Nérac, the residence of the queen of Navarre. Persecution was now raging so hotly that C., having given up all his preferences, left the country and settled in Basle, whence, in 1536, he issued his epoch-making work, the *Christianæ Religionis Institutio*, with its famous preface addressed to Francis I. of France, in which the exile exhorts him to support the Reformation. This work was pub. in Basle in 1535-36. It was written in Lat., and, four years later, trans. by C. himself into Fr. It is the first attempt at a logical and complete definition and vindication of Protestantism. C. then made a short visit to Italy, where the new faith had made some headway, and here he was well received by Renée, duchess of Ferrara. He now paid a last visit to France, where he sold the paternal estates, and set out to settle in Switzerland. In 1536 he was passing through Geneva, at which city Farel was striving hard to establish the reformed faith. This friend entreated him to remain and help in the work, but this he was unwilling to do till Farel threatened him with the curse of God if he should neglect this clear duty. Then C. threw himself into the work with tremendous energy. A Confession of Faith was drawn up and approved by the people, and strict morality was enforced. But a reaction soon came against the strict rule of Farel and C., and the party known as the Libertines gained the upper hand. C. left the city and settled at Strasburg in 1539, where he married Idelette de Bure, a widow, by whom he had one son, who d. in childhood. Meanwhile, Geneva was finding that even C.'s strict rule was better than no rule, and in 1540 he was summoned to return. He was at first unwilling to do this, for his life in Strasburg was an easy one. However, he considered that in Geneva duty lay, and in Sept. 1541 he re-entered the city. Here he devoted himself for the rest of his life to the task of ordering Geneva and the Protestant theology. He estab. the College of Pastors, and did his best to enforce a rigid morality. He also added the reformed churches in all countries, being in correspondence with England, France, the

Netherlands, Poland, etc. In 1559 he founded the academy of Geneva. His activity was prodigious till his death in 1564. During the first fourteen years of his pastorate he was engaged in conflict with the Libertines, who were again his enemies. To the same period belong his three great controversies, with Sébastien Castellio, with Jérôme Bolsec, and with Michael Servetus (*q.v.*). The last is the most memorable. Servetus was a heretic whose views are fully explained in his *Restitutio Christianismi*. He was arrested by the Rom. Church in France, and here C. did his best to secure his condemnation. Servetus escaped and came to Geneva whence C. had promised that he should not escape alive. After a scurrilous verbal conflict, the unfortunate man was tried and sentenced to be burnt. Though the great reformer did his utmost to get the manner of death altered, the sentence was carried out. That C. loathed the doctrines which he found in his book is certain, but that he was actuated by personal spite and animosity against Servetus himself there is no evidence, though undoubtedly he took the initiative in bringing on the trial. The heresy of Servetus was not extirpated with his death, and the trials of sev. of his followers, with the conferences and controversies connected with them, occupied much of C.'s time for sev. years. In connection with such controversies on points of faith, as, for example, his protracted dispute with the Lutherans respecting the Lord's Supper, C. was for many years much troubled, and sometimes even endangered, by the opposition of the libertine party in Geneva to the eccles. discipline which C. had estab. there. But amidst these many cares and consultations on matters great and small, C. found time to commit to writing a number of works besides those provoked by the various controversies in which he was engaged; the most numerous of them were exegetical, though of course it is chiefly as a theologian and the head of a theological school that C. is now known. The incessant and exhausting labours to which C. unsparingly devoted himself could not but tell on so fragile a constitution; but it was not until his frail body, torn by fever, asthma, gout, and stone, had almost collapsed, that his indomitable spirit surrendered. In 1564 his sufferings became so aggravated, that it was evident his life was rapidly drawing to a close. On Feb. 6 of that year he preached his last sermon, having with great difficulty found breath enough to enable him to complete it. He quietly expired in the arms of his faithful friend Beza on the evening of May 27, in the fifty-fifth year of his age. See T. MacCrie, *The Early Years of Calvin*, 1880; H. F. Henderson, *Calvin in his Letters*, 1909; A. Menzies, *A Study of Calvin*, 1918; E. Donmergue, *Jean Calvin*, 1926-27; R. N. C. Hunt, *Calvin*, 1933; J. MacKinnon, *Calvin and the Reformation*, 1936.

Calvinism is distinguished particularly by its dogma of Predestination. This says that God has chosen certain souls for salvation, others for damnation, and that

these decrees are unalterable. To the elect sufficient grace is sure to be given, and also the gift of perseverance. The Westminster Confession is the most complete exposition of the Calvinistic faith. C. is estab. in the Reformed churches, in opposition to the Lutheran, of France, Scotland, Holland, etc. It entered England, and gave birth to the Puritans and the numerous dissenting bodies. Thence also it reached America. Dr. Jowett thought that Calvin was 'the greatest commentator of the Scriptures that Europe had ever known.' Its adherents claim for C. that it is a system of courageous consistency in all its parts, in premise, process, and conclusion, and that 'the men who held it felt that they had their feet upon the last and highest reality.' It was certainly the inspiring force of the men who fought the battles of the Huguenots in France, of the soldiers and citizens, who, in the swamps of Holland, resisted the tyranny of Catholic Spain, and of the Eng. Puritans. For a modern statement of C. see H. Tydeman Chivers, *Is there a Future for Calvinism?* See also bibliography for preceding article.

Calvinistic Methodists, see METHODISM. **Calvinistic Methodist Church of Wales** is the only Church of purely Welsh origin. Its adherents comprise a very large part of the Welsh-speaking pop., the number of communicants being 175,000. The form of gov. is Presbyterian, the church being in federation with the Presbyterian Church of England, the United Free Church of Scotland, and the Presbyterian Church of Ireland. It is also a constituent of the Pan-Presbyterian Alliance. There are foreign missions in India, Assam, and elsewhere. It has about 1500 churches and about 1720 chapels and buildings for Sunday schools and other purposes. In 1933 the Calvinistic Methodist or Presbyterian Church of Wales Act received the royal assent, thereby securing the autonomy of the Church in matters spiritual and the estab. of a properties board. The Church celebrated its bicentenary in 1935.

Calw, tn. in Württemberg, Germany, health resort; had a large timber trade with Holland before the Second World War. Pop. 6000.

Calycanthaceæ, small family of dicotyledonous plants, containing two genera in China and N. America. The species are shrubs, which are usually aromatic and have square stems; the flowers have numerous sepals and petals, perianth leaves, five to numerous stamens, numerous carpels, and an ovary of achenes as fruit. The genus *Calycanthus*, or Carolina allspice, is represented by three species; *C. floridus*, common Carolina allspice, is a fragrant plant with chocolate-coloured flowers, and its bark is used as a substitute for cinnamon. The genus *Chimonanthus*, or Japan all-pice, has two species; *C. fragrans* has lemon-coloured flowers which appear at a different season from the leaves.

Calyceraceæ, small family of dicotyledons formerly considered to be allied to the Compositæ, on account of the form of the inflorescence and the partially fused

stamen anthers. They differ from Compositæ in having the stamen filaments fused, and in the seeds, which are albuminous and pendulous. They are now classified close to the Dipsacaceæ (Teasel and Scabious family). The species of *C.* occur in S. America.

Calycifloræ, name given by De Candolle (q.v.) to the series of plants in which the sepals and petals are separate, the petals are perigynous or epigynous, and the stamens are perigynous. The chief families include the Leguminosæ, Rosaceæ, Saxifragaceæ, Myrtaceæ, Cucurbitaceæ, and Umbellifere.

Calycophyllum, small genus of Rubiaceæ which contains only three species, natives of the W. Indies and S. America. They are small, smooth trees with corymbs of flowers; in some cases the sepals are pink, and give the tree the colour of a rose.

Calydon, anct. tn. in Ætolia which, according to the writings of Pliny, was situated 7½ m. from the sea on the R. Evenus. It was supposed to have been founded by C., the son of Ætolus. The famous Calydonian boar, sent by Artemis to lay waste the fields, is said to have been hunted here by Meleager and other heroes. The walls of C. are sometimes said to be those of the Kastro of Kurtaga. They have a circuit of over 2 m., with one large gate and six little ones. Ruins of terrace walls outside the tn. are thought to indicate the site where the temple of Artemis Laphria stood.

Calymene, genus of fossil trilobites, common in the Silurian rocks of Europe and N. America. It is frequently found in Wenlock limestone in Great Britain.

Calymma, genus of coelenterate ctenophores of the order Tentaculata and family Calymmidæ. The species, some of which are found near the equator in the S. Seas, have strongly compressed and little elevated bodies, and are furnished with tentacles. The term *C.* is also applied to the outer, vacuolated protoplasm of Radiolarians.

Calypso, daughter of Atlas, inhabited the is. of Ogygia. According to Homer, when Odysseus was wrecked on her isle, she treated him hospitably and promised him immortality if he would marry her. She detained him for seven years and bore him two sons, but finally the longing for home prevailed, and he left her to die of grief at his departure.

Calyptra (Gk. *καλυπτειν*, to conceal), name given in botany to a hoodlike body connected with the organs of fructification. In the *Musci*, or mosses, it is formed from the upper half of the enlarged and ruptured archegonium, and is a membranous cap. In *Pileanthus* it is formed of united bracts, in *Eucalyptus* and *Eudesia* it is a lid or operculum to the stamens, produced in the one case by the consolidated sepals, in the other by the consolidated petals.

Calyptraea, cup-and-saucer limpet, is a genus of gastropod mollusc described by Lamarck. The species are numerous and widely diffused, and fossil species occur in the tertiary strata.

Calytostegia, genus of temperate and sub-

tropical Convolvulaceæ, consisting of lactescent, glabrous, twining, or prostrate herbs, with solitary one-flowered peduncles. *C. sepium*, the larger bindweed, which grows in Brit. hedges, has two large bracteoles which invest the calyx, and is fertilised by a hawk-moth called *Sphinx convolvuli*. *C. Soldanella*, the sea bindweed, is a native of European sea-coasts and some parts of Asia. The young stalks are sometimes pickled and the juice of the plant is a cathartic.

Calyx, term applied in botany to the external set of floral leaves, each of which is called a *sepal* and is usually green, but may be coloured, or *petaloid*, e.g. monkshood. The sepals serve as a protective structure to the more important parts of the flower, and when coloured they attract insects. When they are separate from one another, the *C.* is *polysepalous*, e.g. in buttercup; when united, it is *gamosepalous*, e.g. in primrose. When the *C.* is below the gynoecium, it is said to be *inferior*; when above, it is *superior*. If the sepals fall off before the flower opens, the *C.* is *caducous*, e.g. poppy; if they fall off after the flower has opened, it is *deciduous*; if they remain until the fruit is ripe, it is *persistent*, e.g. violet. The *C.* is frequently quite inconspicuous and rudimentary, and in other cases it is represented by a *pappus* of hairs, e.g. dandelion; in the apple and pear it helps to form the fruit. In describing it fully, attention must be paid to the number of whorls, number of free sepals, or lobes of sepals, and to their shape, of which the terminology is the same as that of leaves. The terms used for the general form of the *C.* are the same as those for the corolla, e.g. *surred*, in 'nasturtium' (*Tropæolum*), *galeate* in monkshood, *saccate* in wallflower. In some flowers, for instance, strawberry and geum, extra segments are present between the true sepals and constitute an epicalyx.

Cam, riv. which rises in Ashwell, Hertfordshire, England, and flows 40 m. N.W. and N.E. through Cambridgeshire, and then into the Ouse, 3½ m. S. of Ely. It is joined at Grantchester by the Granta, which rises in Essex. It is navigable to the tn. of Cambridge.

Cam (Cão), Diogo, Portuguese navigator of the fifteenth century, who continued the explorations of the African coast, begun by Prince Henry of Portugal. In 1482 he discovered the Congo, and afterwards explored the W. African coast to 22° S. lat.

Camaguëy, see PUERTO PRINCIPLE.

Camaien, see CAMEO.

Camaldolenses, Camaldolites, also called Camaldulians, strict religious order whose founder was Romuald, a Benedictine monk (c. 950-1027). The monks were divided into two classes, *Cænobites* and *Eremites*, and wore white garments. Their huts were built in the plain of Camaldoli, near Arezzo in the Apennines. As the order grew, so in time the collection of separate huts became grouped into a hamlet of cells with an abbot presiding; one common place of worship was instituted. Both Guido Grandi and Pope Gregory XIII. belonged to this order.

Camalodunum, or **Camulodunum**, see COLCHESTER.

Camargue, La, is in France, situated in the delta of the Rhône. It covers an area of 150 sq. m. One-third of its extent is marshland, but on the other two-thirds wine and cereals are grown, and there is pasture land for cattle and sheep. If it were not for dikes that have been built it would be inundated. The mistral, a cold north wind, blows over this is., thereby making it healthier than it might otherwise be. Numbers of seabirds are to be found here.

Camarilla, Sp. word originally denoting the small or audience chamber of the king, but it has now come to mean a court clique or group of favourites, who influence a pope or monarch in opposition to his official advisers and ministers.

Camarina, tn. situated on the S. coast of Sicily. It was founded as a colony from Syracuse in 590 B.C., and twice the people of Gela recolonised it, namely, in 492 or 495 B.C. and in 461 B.C. It was destroyed four times: by the Syracusans in 552 B.C. (because it had thrown off its allegiance to the mother city), by the Carthaginians in 405 B.C., by the Romans in 238 B.C., and finally by the Saracens in A.D. 853.

Cambacérés, Jean Jacques Régis de (1753-1824), Fr. legis. who lived in the time of the Fr. Revolution. He was appointed member of National Convention in 1792, but was strongly opposed to bringing the king to trial. After the fall of Robespierre, he was made president of the Convention and president of the Committee of Public Safety (1794). C. was suspect on more than one occasion on account of his moderate views, and lost office for a time; appointed second consul under Napoleon, and subsequently created high chancellor of the empire, and duke of Parma. He was partly instrumental in the compilation of the *Code Napoléon*. Upon the restoration of Louis XVIII., he went into exile, but was recalled in 1818.

Cambay, native Muslim state with an area of 390 sq. m. and a pop. of 71,715 on the gulf of C. in the N. of the port of Bombay, India. There are many ruins which testify to a time of great prosperity, but the tn. has declined owing to the state of navigation. The cap. C. reached its highest glory at the beginning of the seventeenth century, and according to the first canto of part ii of *Hudibras* (1664) the daily food of its princes was 'asp and basilisk and toad.' (According to *Purchas His Pilgrimes*, it was only Macamut, sultan of Cambaya, who lived on poison so that his saturated breath or touch carried death.) In 1583 Queen Elizabeth addressed letters to Akbar as king of C. It began to decline as Surat flourished, and is now an unimportant place, but with manu. of agate, cornelian, and onyx ornaments. Pop. 97,000.

The gulf, shallow and abounding in shoals and sandbanks, penetrates the coast of India for about 80 m. The tides, which are high, run into it with great velocity, but at low water the bottom is left almost dry for some distance below the lat. of C.

Camber, in engineering, an upward curve or convexity applied for a specific purpose. In roads, it denotes the rise from the channel to the crown. Generally speaking, the rougher the surface, the steeper the C., the purpose being to allow wet to run off into the channel. The rise is anything from 1 in 30 to 1 in 50—the latter for asphalt surfaces. In aeronautics C. is the degree of curvature of a wing or controlling surface. C. is also given to the decks of ships.

Camberley, dist. of Surrey, England, on the S. Railway, 7 m. from Ascot. The Army Staff College was built here in 1858.

Cambert, Robert (c. 1629-77), Fr. musical composer, b. in Paris. He was musical director at the court of Anne of Austria, mother of Louis XIV. Associated with the Abbé Perrin, who had obtained a grant of monopoly for the performance of musical stage works in the Fr. language, C. composed the music for Perrin's *Pastorale*—claimed, though probably erroneously, to be the earliest Fr. comedy in music or opera—performed at the Châteaufort in 1659. Through the privilege of this monopoly was performed in 1671 C.'s own opera *Pomone*, also claimed to be the first Fr. opera—a fact which 'largely constitutes his historical importance' (Scholes). (See, however, on this Loewenberg's *Annals of Opera*, 1943.) With Perrin as librettist C.'s *Ariadne*, rehearsed in Paris in 1669, was (probably) produced in London in 1674. Lully bought Perrin's monopoly and C. went to England, where, according to some, he was murdered by his valet. See also A. Pougin, *Les Vrais Créateurs de l'Opéra français*, 1881.

Camberwell, parl. and metropolitan bor. in co. of London. It returns four members to Parliament. Pop. 252,000.

Camberwell Beauty (*Vanessa antiopa*), large and beautiful butterfly, rare in Britain but common in central and S. Europe and N. America. The wings are a deep purplish-brown, with outer band of black and greyish-white or yellow border. The black band contains a row of large blue spots. In addition the two small wings have two small white spots. Formerly found occasionally at Camberwell, when that was a rural place.

Cambiassi, Luca (1527-85), Genoese painter, b. at Moneglia in the Genoese state. At fifteen he helped his father to paint subjects from Ovid's *Metamorphoses* on the front of a house in Genoa. He became a great friend of the artist Giambattista Castello, whose work closely resembled his own in character. In 1583 Philip II. commissioned him to finish a series of frescoes begun by Castello in the Escorial. C. was very dexterous with his brush, and sometimes painted with one in each hand. His best works are at Genoa.

Cambium, single layer of cells found between the primary wood and the bast of the vascular bundles in most dicotyledonous plants which are then said to be open. Each cell has thin walls made of cellulose, and is rich in protoplasmic contents; in transverse section it appears

four-sided and flattened, and in longitudinal section it is elongated. By successive div. of the single layer, the C. gives rise to other layers which form secondary wood, secondary bast, and also secondary modularity rays, so that a C.-ring is formed internal to the bark. Cork-C., or phellogen, is a layer of meristematic cells which arises in the epidermal region and forms cork.

Cambodia, one of the provs. in Fr. Indo-China. The name C. is European, and is derived from the Hindu Kambuja. Kambu was the name of the mythical founder of the Khmers, anct. inhab. of C.

the lower Mekong, which, entering this ter. on the N., flows S. for some distance, then inclines S.W., as far as Pnom-Penh, where it spreads into a delta, and resumes a southerly course. Fishing forms the staple trade of C., for Tonlé-Sap supports a fishing pop. of over 30,000. The fish are caught by means of large nets at the end of the floods, and are either dried or fermented for nuoc-mam sauce. Next to fishing come the agric. products, and here rice is largely grown in the low-lying dists. Agric. products grown include the tobacco plant, coffee, cotton, pepper, indigo, maize, tea, silk, and rubber. The



MEKONG RIVER CRAFT AT PNOM-PENH

E.N.A.

Geography.—This large tract of country in S.E. Asia (area, 67,550 sq. m.) is bounded on the E. by Annam, on the S.E. by Cochín-China, and on the S.W. by the gulf of Siam. There are two marked features in C. which add to its geographical importance. These features are the R. Mekong and the large lake Tonlé-Sap. The lake serves as a reservoir for receiving the overflow waters of the Mekong, which becomes greatly swollen by the rains and melted snow from the Tibetan range in the month of June. At this period the lake, which is fed by an arm of the R. Mekong called the Bras du Lac, attains to a depth of from 45 to 48 ft., overflows its banks, and inundates the country round for over an area of 770 sq. m. Conversely, during the dry season, when there is a shrinkage of the waters of the Mekong, the Tonlé-Sap Lake also becomes greatly reduced in area, and its depth falls to an average of 5 ft. The whole of C. lies in the basin of

chief native activity is the salting and smoking of fish from the lakes. Cattle-breeding is also a flourishing native occupation. Other native industries are weaving of silk and cotton, pottery, and the making of rush mats. The exports are rice, salted fish, pepper, maize, cotton, tobacco, fish-oil, palm-sugar, kapok, resin, hides, and cattle. The chief tns. are Pnom-Penh, the cap. (pop. 104,000) situated at the crossing of Tonlé-Sap and Mekong Rs.; Battambang, 180 m. further N.W.; Kampot (92 m. from the cap.); and Kompong-Cham. There are two small sea harbours, Kep and Ream, both on the gulf of Siam and connected to Bangkok by steamers. There are nearly 900 m. of waterways and 2000 m. of asphalt and macadamised roads, the chief roads being from Saigon to the Siamese frontier, via Pnom-Penh and Battambang, from Pnom-Penh to the gulf of Siam, from Saigon to Kratie and from Pnom-

Penh to Angkor. A railway from the cap. to Mongkol Borey will link up with the Siamese railway system.

Climate.—Much the same as that of Cochín-China, and varies with the monsoons. During the N.E. monsoon, which lasts from mid Oct. to mid April, the weather is dry and warm, with a temp. ranging from 77° to 80° F. From mid April onwards until Oct. there is constant rain, and the temp. is considerably higher, sometimes reaching 95° F. Wild animals of all sorts abound, such as the elephant, rhinoceros, buffalo, tiger, panther, and leopard. Monkeys and rats are the plague of the dist., as they destroy the crops and agric. products.

The People.—C. consists of three or four races. The majority are the Cambodians themselves, whilst the rest are Annamese, Chinese, and Malays. Uncivilised tribes are met with in the thinly populated dists. on the outskirts of the forests, and among the mts. The Cambodian men are tall contrasted with the Annamese, whilst the women are short and thick-set. They have dark brown skins, flat faces, short noses, and black hair. Class distinction is represented by caste founded on blood-relationship. The different castes and the mandarins are exempt from all taxation and all military service. Although Buddhism is the prevailing religion, there are many converts to Catholicism amongst the Annamese, and Brahmanism is still retained at the court. The Cambodians are a superstitious race, and the worship of spirits or local genii largely prevails.

History.—There are ruins of cities, palaces, and bridges near Lake Tonlé-Sap, which point to the prosperity of the Khmers or Cambodians in the Middle Ages. The royal city Angkor Thom still displays its mighty ruins (see ANGKOR). War against Phais or the inhab. of Slam, together with internal revolts and feuds, have brought about the decadence of C. The invasion of the country under Europeans completed its final overthrow, and in 1863, after renewed hostilities with Siam and Annam, C. became a protectorate under Fr. supervision in 1867. C. is divided into fourteen provs. controlled by Fr. residents.

By a treaty of 1941 France ceded all C. W. of the Mekong and N. of Angkor Thom to Siam, but reserved the latter archaeological centre to Indo-China. The ceded Cambodian ter. was demilitarised. Japan was given the right to station a garrison at Phnom-Penh as well as at a number of other places. But Japan's chief gain was Cam Ranh Bay, where Jap. forces were promptly concentrated to the exclusion of all others. In a few weeks the Jap. occupation was complete and their forces were stationed on the Siamese border facing Siamese troops who had estab. themselves in the supposedly demilitarised areas acquired the previous winter from Indo-China. There was some support for Gen. de Gaulle (q.v.) in C. as in Indo-China generally. After the Jap. collapse in 1945 C. reverted to France. Until the constitution of the Federation of

Indo-China has been settled, relations between France and C. are governed by the convention signed in Jan. 1946 between the Fr. commissioner and the Cambodian Prime Minister. The king, Norodom Sihanouk, who succeeded in April 1941, promulgated a constitution in May of that year. Under this instrument he governs through a council of ministers who are assisted by Fr. advisers. Legislative power is exercised by an elected assembly. There are only 2000 Europeans in C. and 3,048,000 other races, divided as follows: Cambodians, 2,594,000; Annameses, 191,000; Chinese, 106,000; Malaysians, 74,000; Laotians, 20,000; other races, 54,000. See C. Roubéquin, *The Economic Development of French Indo-China* (trans. by T. A. Ward), 1944.

Cambodia River, see MEKONG.

Camboge, see GAMBOGE.

Cambon, Jules (1845-1935), Fr. diplomat, b. in Paris. Governor-general of Algeria, 1891; ambas. in Washington, 1897; in Madrid, 1901. He was ambas. in Berlin when the First World War broke out. In the Fr. Yellow Book he gives a searching analysis of Germany's relations with France during the two or three years preceding the war. He shows how, despite the aversion from war of the S. states, there was in political matters in Germany an all-powerful undercurrent, which in its steady flow swept pacific influences away into the abyss of war, and that in Germany's eyes a regenerate France was incompatible with a free Germany. His account of his interview with Herr von Jagow, Germany's foreign minister, on July 24 certainly engenders the suspicion that Germany and Austria were playing for a bold stroke in the belief that Russia would remain passive. He was secretary-general to the Foreign Ministry, 1915.

Cambon, Pierre Paul (1843-1924), Fr. diplomatist, b. in Paris. Educated at Lycée Louis-le-Grand and at Ecole de Droit; called to Bar. Secretary to Jules Ferry. Resident in Tunis, 1882. Ambas. in Madrid, 1886; Constantinople, 1891; London, 1898. He took an active part in establishing the Anglo-Fr. Entente. Retired 1920.

Camborne, mkt. tn. in Cornwall, England, 12 m. W.S.W. of Truro and 3 m. S.W. of Redruth, the centre of a mining dist. Here is the School of Metalliferous Mining. Pop. of ward, 14,000; of urban dist., 36,000.

Cambrai, tn. in France, in the dept. du Nord, situated some 32 m. from Lille. Chief manufs.: cambic lace, linen, thread, soap, and leather. It is a picturesque tn. with broad, irregular streets, possessing a fine cathedral, theatre, and archiepiscopal palace, and a place of historical interest, for it was a long time under the rule of bishops, from whom the people succeeded in obtaining a charter in 1227. Its anc. name was Camaracum. The famous League of C. was formed here (1508). The city fell into the hands of the revolutionists in 1793, when the cathedral was destroyed. The bones of Fénelon were ignominiously

disturbed, but tribute was paid to his memory in 1825, when a monument was erected to him in a new cathedral. Pop. 28,000.

Cambrai, Battle of (N. France).—Two battles took place round C. in the First World War: (1) In 1917 the Gers. were heavily pressing the Ita., and with a view to relieving this pressure, by preventing further Ger. divs. being taken from the W. front, a Brit. offensive against C. was planned, to be undertaken by the Third Army under Gen. Byng. Gen. von Marwitz was opposed to him. In place of the usual bombardment, which had hitherto announced the attacker's intentions, an enormous number of tanks was employed to destroy minor obstructions such as barbed-wire entanglements and machine-gun posts. The surprise nature of the attack proved to be the main feature contributing to success. The attack was launched on Nov. 20, 1917, with successful initial results, but the Gers. heavily and persistently counter-attacked at Hourion Wood (g.v.), which was ultimately abandoned before C. was taken. (2) The great Brit. final offensive against the Gers. began in Aug. 1918, and to the Brit. First Army (to which a Canadian corps was added) under Gen. Horne was allotted the capture of C. The Canadians opened the attack on Aug. 26, and gained their first objectives, but as progress was made resistance became increasingly formidable as the Gers. strengthened their rear lines. Resistance was first met in the Scarpe valley. Protecting C. to the N.W. was the Ger. Drocourt-Quéant line. This was attacked on Sept. 2, and after only four hours' fighting the whole of the line, with its supporting lines, was in Brit. hands. The Gers. hastily withdrew their remaining troops in this area and prepared to make another stand behind the Canal du Nord, which held up the Brit. advance. So far ten Brit. divs. had defeated thirteen Ger. divs. with considerable loss to the enemy. On Sept. 27 the Canal du Nord was crossed on a narrow strip where it happened to be dry, and hostile positions to the N. of C. were captured. The advance was continued the next day, and Fontaine Notre-Dame, to the S.W. of C., was captured. C. was now gradually becoming enveloped, but violent Ger. counter-attacks compelled ground to be given up in one or two places. Both sides were becoming exhausted with the struggle, but neither weakened, and on Sept. 30 another Brit. and Canadian advance carried the line beyond C. on the N. as far E. as the canal at Ramillies. By Oct. 1 all the suburbs of C. had fallen. Steady progress to the S. of C. was being made by the Third Army, which had also commenced its advance on Sept. 27. One of its important objectives was the spur which dominated the country about Marcoing; Ribecourt just S. of this position, was taken early in the advance, and by the evening Brit. troops were in the neighbourhood of Marcoing. At this time the First and Third Armies were in contact at Fontaine Notre-Dame. The next day

the advance was continued against great opposition, but by nightfall the Gers. had been driven over the Scheidt Canal, and the Allies' troops were firmly estab. at Noyelles and Marcoing. On Sept. 29 some of the Third Army crossed the canal about Masnières, while further N. others crossed at Noyelles and Marcoing, thus pressing on C. from the S. Resistance now became stronger than ever, and the Gers. were fighting with great stubbornness. Nevertheless, the Brit. troops were gradually closing round the city. Further S. the Australian troops were attacking about Masnières, and on Oct. 3 had captured ground to the E. of it and on the 5th took Montbréhain. C. fell on the same day. This battle proved to be one of the sternest fought during the war. Throughout this great battle the Canadians under Gen. Currie fought with conspicuous bravery, and the success of the operations was due mainly to their extraordinary exertions.

Cambresis, anct. div. of the prov. of Flanders, which now forms the chief part of the dept. of Cambrai (France).

Cambria, Lat. name of Wales, derived from Celtic Cymry or Kymry, and originally applied to both Wales and the Cymric kingdom of Strathclyde. The name also appears in the Cambrian Mts., Cumbria, and Cumberland.

Cambrian Rocks, name given by Prof. Sedgwick to a stratified system of rocks occurring between the Silurian and Archaean systems which is found in a high state of development in Wales (Cambria). A famous controversy took place between Sedgwick and Murchison, a geologist who had been working contemporaneously with Sedgwick in another part of Wales, and who maintained that C. R. belonged in reality to the Silurian system. C. R. are the oldest rocks to contain well characterised fauna. The fossils found in rocks of this system include crustaceans, brachiopods, pteropods, worms, sponges, and coral, traces of marine life, worm holes and worm-castings being abundant. It is evident that the rocks were formed by sedimentary deposition from water, although they probably never formed the bed of a deep ocean, since there is much evidence, such as the occurrence of ripple marks, to show that the water was not of great depth. A noteworthy fact is that in the case of the crustaceans some of the trilobites are apparently deficient in the organs of vision. C. R. are recognised chiefly in Wales, Scotland, Ireland, Europe, N. Asia, and N. America the strata varying in depth from 3000 to over 30,000 ft. The strata consist mostly of schists, slates, and limestones, and are usually unconformable on the older rocks of the pre-Cambrian period.

Cambric, name given to fine white linen fabrics, originally manufactured at Cambrai in the Fr. dept. of Nord. Some of the best Cs. are now manufactured in Switzerland, while Scottish C. is an imitation of real C., in which the linen is replaced by finely twisted cotton.

Cambridge, municipal and parl. bor.,

co. tn. of Cambridgeshire, 56 m. N.E. of London, and 76 m. N.E. of Oxford. The tn. lies in a level plain, on the S. edge of the Fen country, and to its position here it probably owes its development, for the position of the hills around makes it the natural starting-point in crossing the Fens from the midlands. That its importance was early recognised is shown by its antiquity. There are probably anct. Brit. remains in Castle Hill, two Rom. roads cross here, the tower of St. Benet's Church is one of the finest pieces of Saxon work in the country, and its importance in Norman times is well known, whilst the Church of the Holy Sepulchre is the oldest of the four round churches in England. The univ. (see CAMBRIDGE, UNIVERSITY or) is one of the oldest in Europe. The Leys School (q.v.), founded in 1874, is a public school for boys. There are four large grammar schools: Perse School (q.v.), founded in 1615; Perse School for Girls (1881); and the C. and co. high schools for girls and boys. The tn. is built chiefly on the rvs. Granta and Cam (one riv.). It has manufs. of scientific instruments, and light and electrical engineering, and it is the centre of a prosperous agric. dist. The name is generally derived from *Grantebrigg* or *Grantabridge*, though the intermediate stage is not extant. The pop., which was increased to 59,000 in 1922 by the operation of the Cambridge Corporation Act of that year, is 90,500. See C. W. Stubbs, *The Story of Cambridge*, 1912, 1932; B. W. Downes, *Cambridge, Past and Present*, 1926.

Cambridge: 1. City and one of the co. seats of Middlesex co., Massachusetts, U.S.A., on the Charles R. It almost forms a suburb of Boston. It is divided into various sections: Old C., the seat of Harvard Univ., N. C., port, and E. C. The two last are the manufacturing dists. Besides printing and publishing, carpentering, furniture-making, meat-packing are flourishing industries. Pop. 110,800. 2. Co. seat of Dorchester co., Maryland, U.S.A., on the Choptank R., 60 m. S.E. of Baltimore; centre of a farming region, and exports fish. Manufs. canned vegetables, flour, underwear. Pop. 28,000. 3. Co. seat of Guernsey co., Ohio, U.S.A., on Wills Creek, 75 m. N.E. of Columbus. Coal, oil, clay, and iron are found in the vicinity. Pop. 15,000.

Cambridge, Adolphus Charles, first Marquess of (1868-1927), eldest son of the prince of Teck, whom he succeeded in 1900, and Princess Mary of C., and elder brother of Queen Mary (widow of George V.). Saw service in the S. African war, 1899-1902, lieutenant-colonel of Life Guards, 1914. Renounced continental titles in 1917, assuming the name of C.

Cambridge, Adolphus Frederick, first Duke of (1774-1850), seventh son of George III., b. at Buckingham (then Queen's) Palace. He served in the campaign of 1794-95, and was created duke of C. in 1801, appointed field marshal in 1813, and was viceroy of Hanover from 1816 to 1837.

Cambridge, George William Frederick Charles, second Duke of (1819-1904), first

cousin of Queen Victoria, b. in Hanover, the only son of George III.'s seventh son, Adolphus Frederick. He was present at most of the engagements in the Crimean war. Made field marshal in 1862, and held position of commander-in-chief from 1856 to 1895. His administration was marked by a conservative spirit towards innovation, together with a warm interest in the welfare of the private soldier. He married an actress, Miss Farebrother, their children bearing the name of Fitz-George.

Cambridge, Richard Owen (1717-1802), Eng. poet. First studied law. At his family seat of Whitminster, Gloucestershire, he wrote his poem *Scriblerial*, pub. in 1751. Other poems: *Dialogue between a Member of Parliament and his Servant* (1754); *The Faker* (1756). All were successful but are now forgotten.

Cambridge Platonists, mid-seventeenth-century Cambridge philosophers, opposed to Puritan extremism and the materialism of Hobbes and Descartes. They taught the harmony of religion and reason, the unity of truth and moral goodness, and the rational basis of morality.

Cambridgeshire, E. inland co. of England, bounded N. by Lincolnshire, E. by Norfolk and Suffolk, S. by Essex and Hertfordshire, W. by Bedfordshire, Huntingdonshire, and Northamptonshire. The surface is generally very flat, and large parts, particularly in the N., consist of fens (q.v.). Undulations occur in the S., where the Gog-Magog Hills, S.E. of Cambridge, are the most important elevations. The S. is also better wooded than the rest of the co. In the N. occurs the Bedford Level (q.v.). The prin. riv. is the Ouse, which crosses the co. from W. to E., with its tribs. the Cam, Lark, and Little Ouse. The Nene, in the N., is also important. These rvs. flow chiefly in artificial channels of recent construction, and are extremely sluggish. The co. is intersected by numerous drainage works. C. is a rich agric. dist., and the climate is on the whole healthy. The fen-land, when drained and burnt, provides good soil for various crops, and the hills are mainly chalk. The co. is one of the chief grain-producing dists. of England. Dairy farming and sheep-rearing are also extensively carried on. There are some manufs., including light and electrical engineering, fruit-canning, jam-making, sugar-beet refining, brewing, and brick-making.

In Celtic times C. was in the ter. of the Iceni, and possesses some pre-Rom. remains, while relics of the Rom. occupation, in roads, urns, coins, etc., are common. At the Norman Conquest the dist. stubbornly resisted the Norman invader, and at Ely Hereward the Wake held out against him for some years. Ely possesses a very fine cathedral, notable for its lantern tower and Perpendicular detail. The co. was prominent in the internecine struggles under Stephen, John, Henry III., and Charles I. The prin. tns. are Cambridge (the co. tn.) Chatteris, Ely, March, Soham, Whitby, and Wisbech. For administrative purposes C. is divided into two cos., C. and the Isle of Ely. C., Cambridge bor., and the Isle of Ely

constituencies each return one member to Parliament. Area (including Isle of Ely) 553,241 ac. Pop., exclusive of administrative co. of Isle of Ely, 163,000 (including Isle of Ely, 254,000). See C. Fox, *The Archaeology of the Cambridge Region*, 1923; A. Mee, *Cambridgeshire*, 1939.

Cambridge, University of, is one of the oldest univs. in Europe. The earliest evidence that there were bodies of students in Cambridge dates from the beginning of the thirteenth century. In 1231 Henry III. issued a number of writs for the organisation and discipline of the students, and in 1284 Peterhouse, the first of the colleges, came into being as a

tury the prin. subjects of further study were theology, canon law, civil law, and medicine, and candidature for a doctor's degree required a further period of residence of at least eight years. The sixteenth century saw the introduction of Gk., when Erasmus held the Lady Margaret's professorship of divinity in 1511, and the stimulus received from the Reformation was responsible for a great development in the univ. which at this time came to be considered a rival to the univ. of Oxford.

During the Civil war the sympathies of the colleges were royalist, and many of the heads of colleges were deprived of their



WREN BRIDGE AND CLARE COLLEGE, CAMBRIDGE

The Times

house of residence for members of the univ. Formal recognition of the univ. came in 1318 when Pope John XXII., at the request of Edward II., confirmed its privileges with the issue of a bull decreeing that it should be a *studium generale* and should enjoy the privileges of a *Universitas*. From then onwards a Cambridge doctor could lecture in any part of the Christian world, and the univ. itself was independent of the jurisdiction of the bishop of its diocese. New statutes were given to the univ. in the year 1570, and in 1573 it received its grant of arms. The prin. effect of the new statutes, which remained in force for nearly three hundred years, was to increase the power of the vice-chancellor and the heads of the colleges.

In the medieval univ. the student followed a three-year course of Lat. grammar, logic, and rhetoric, known as the *trivium*, and became an 'incepting' bachelor. He then proceeded to the *quadrivium*—a course of geometry, arithmetic, and astronomy, lasting for four years, and was then entitled to proceed to the degree of Master of Arts. Until the fifteenth cen-

tuaries, which were, however, restored after the Restoration. The latter half of the seventeenth century was noteworthy for two developments within the univ.—the rise of the Cambridge Platonists (*q.v.*) and the increasing prominence of mathematical studies. The first professorship of mathematics was estab. in 1663, and its second holder (1669) was Isaac Newton.

The univ. curriculum was further broadened throughout the eighteenth century, and examinations assumed a greater importance, in contrast with the disputations, known as 'acts' and 'opponencies,' of earlier times. Written examinations were first introduced in 1772.

The nineteenth century was a period of reform and expansion. Honours examinations or triposes (*see below*) were introduced in classics in 1821, and within fifty years in moral sciences, natural sciences, law, and hist. In 1871 religious tests were abolished. In 1850 and 1872 royal commissions recommended many changes, which resulted in the statutes of 1856 and the Oxford and Cambridge Act of 1882. The prin. results of the legislation of this period were (1) to redress the

balance between the univ. and the colleges, and to give to the general body of Masters of Arts much of the influence hitherto exercised by the college heads; (2) to abolish the tenure of college fellowships for life without conditions of work or residence, and to associate them with the holding of a univ. or college office, and (3) to raise the general intellectual level by competition among entrants to the univ., and among its senior members.

The development of univ. studies during the last years of the nineteenth century and the beginning of the twentieth outstripped the capacity of the univ. and the colleges, and in 1914 the univ. made formal application for a subsidy from public funds. This led to the first gov. grant of £5873 for medical education. In 1919 the vice-chancellor informed the president of the board of education that the univ. would welcome an inquiry into its resources, and stressed its urgent financial needs. The result was a special grant from the Treasury of £30,000, the forerunner of increasing ann. grants subsequently provided on the recommendation of the Univ. Grants Committee. In 1919 a royal commission on the univs. of Oxford and Cambridge was set up. It reported in 1922, and was followed by a statutory commission whose statutes were approved by the king in council in 1926. The main effects of these statutes were (1) the transference of the control of univ. legislation from the Senate (Masters of Arts and holders of higher degrees) to the Regent House (approximately, the resident members of the Senate); (2) the institution of the faculty system of instructions with a consequential transference of formal teaching from college to univ. teaching officers; (3) the fixing of age limits for the tenure of univ. and college offices; and (4) the setting up of an obligatory pension scheme. By these statutes the univ. is still governed.

While certain functions are reserved to the Senate, such as the election of the chancellor and other officers of the univ., and the approval of proposals for the conferment of degrees, the gov. of the univ. now rests in effect with the Regent House. Legislative proposals are called *graces* (Lat. *gratia*), which are submitted at periodic meetings of the Senate and of the Regent House, called congregations, presided over by the vice-chancellor.

The colleges of the univ. are corporate bodies having their own statutes and managing their own affairs. Further information is given in articles under their respective names. In order of foundation they are Peterhouse, Clare, Pembroke, Gonville and Caius, Trinity Hall, Corpus Christi, King's, Queens', St. Catharine's, Jesus, Christ's, St. John's, Magdalene, Trinity, Emmanuel, Sidney Sussex, Downing, Girton (for women), Newnham (for women), Selwyn, and Fitzwilliam House (for non-collegiate students). Women first became full members of the univ. in 1947. Before coming into residence a candidate for admission to the univ. must be accepted by a college, must pass or gain exemption from the Previous Exami-

nation (including papers in Lat.), and may also have to pass a college entrance examination. At the end of three years an undergraduate may proceed to the degree of Bachelor of Arts. Honours degrees are conferred on the results of examinations called *tripsos*, which are held annually in May and June in mathematics, classics, moral sciences, natural sciences, theology, law, hist., oriental languages, modern and medieval languages, mechanical sciences, economics, archaeology and anthropology, Eng. geography, music, and chemical engineering. Special Examinations are held for degrees in medicine and surgery. An Ordinary B.A. Degree, as distinct from an honours degree, may be conferred on a student who has passed examinations in Christian theology, architectural studies, engineering studies, agriculture, or estate management.

Facilities for the education of adults who are not members of the univ. are provided in the form of lectures and classes at centres outside Cambridge, and of vacation courses in Cambridge, by the Univ. Board of Extra-mural Studies.

The number of students in residence during the academic year 1949-50 was 7986 (men 7277, women 709), of whom 707 were undertaking research for a degree or for a higher diploma.

See *Statutes and Ordinances of the University of Cambridge*, 1919 (reprinted every three years, supplement pub. annually); *The Student's Handbook to Cambridge* (pub. annually); *The Cambridge University Calendar* (pub. annually); R. Willis and J. W. Clark, *Architectural History of the University of Cambridge*, 1886; T. Atkinson, *Cambridge Described and Illustrated*, 1897; S. C. Roberts, *Introduction to Cambridge*, 1948; *Report of the Oxford and Cambridge University Commission*, 1922.

Cambridgeshire Regiment. Raised in 1860 as a volunteer battalion. A contingent served in the S. African war 1899-1902. In 1907 it became a unit of the Territorial Force (now Army). During the First World War it went to France in Feb. 1915 and within a month distinguished itself at St. Eloi. Four battalions were raised for the campaign and took part in the battles of Ypres, the Somme, Kemmel Hill, and the allied victorious final advance. During the Second World War the C. R. produced two battalions; both went out to Singapore and both were lost, being captured by the Jap. The regiment was not reconstituted until Jan. 1947. For some years they had been linked, for administrative purposes, with the Suffolk Regiment, but in recent times they have become a unit of the Royal Artillery.

Cambuskenneth, ruined abbey in Stirlingshire, Scotland, on R. Forth, 1 m. E. of Stirling, founded by David I. in 1147. The first Scots Parliament, attended by representatives of burghs, assembled here in 1326. James III. and his queen, Margaret of Denmark, were buried in the abbey, and their remains were discovered during excavations in 1864, and reinterred with an altar memorial erected over them by command of Queen Victoria in 1865.

Cambuslang, tn. in N.W. Lanarkshire, Scotland, situated on the l. b. of the R. Clyde, about 3 m. S.E. of Glasgow. It has large steel works and coal mines. Pop. 25,000.

Cambyzes, or **Kambujiya** (529-521 B.C.), second king of the Medes and Persians, was the son of Cyrus the Great. After assassinating his brother Smerdis, he wished to form an alliance with Egypt, but, receiving an affront from the Pharaoh, he invaded that country, and conquered it in six months.

Camden: 1. City and port of New Jersey in U.S.A., and the cap. of C. co. It stands on the l. b. of the Delaware, opposite Philadelphia, and has foundries, cotton and woollen mills, chemical and glass works, etc. Pop. 117,000. 2. Co. seat of Kershaw co., S. Carolina, U.S.A., 33 m. N.E. of Columbus. Occupied by the Brit. in 1780 when an Amer. force was defeated here by Lord Cornwallis. Cotton, grain, and rice are produced in the vicinity. Pop. 5,750.

Camden, Charles Pratt, first Earl (1714-94), Eng. lawyer and politician, was b. at Kensington, and educated at Eton and King's College, Cambridge. He was called to the Bar in 1738, but had practically no briefs till 1752, when he made his name as junior to R. Henley, who fell ill and left the case to him. He was made king's counsel and attorney-general to the Prince of Wales in 1755, in 1757 attorney-general, and in 1759 recorder of Bath. In 1761 he was knighted and made chief justice of the court of common pleas, and in 1765 was raised to the peerage as Baron C. of Camden Place, Kent. In the following year he succeeded Worthington on the woolsack, receiving an addition of £1500 to his salary as recompense for the loss of his justiceship. He held the office till 1770, although he disapproved of the policy of the gov. He lived in retirement till 1782, when he became president of the council till 1783, and again in the following year till his death. Created Earl C. 1786.

Camden, William (1551-1623), Eng. scholar, historian, and antiquary, was b. in London, his father being a painter. His early education was at St. Paul's School and Christ's College. In 1566 he went to Oxford, which he left in 1571 without having taken a degree. In 1575 he was made second master of Westminster School, of which he became principal in 1593. The first ed. of *Britannia*, the work which has made his name famous, was pub. in 1586, the result of some fifteen years' research (in 1605 he pub. his *Remains Concerning Britain*, a book of collections from his *Britannia*). He was perpetually improving this, and in 1607 the sixth ed. was reached. It is written in elegant Lat., and was first trans. into Eng. in 1610. The best trans. was pub. in 1789 (2nd ed., 1806) by Gough and Nichols. In 1597 C. resigned his headmastership on being appointed Clarenceux king-of-arms. Other important works of his are a list of the epitaphs in Westminster Abbey, entitled *Reges, Reipnæ, Nobiles et alii in ecclesia collegiata*

Beati Petri Westmonasterii sepulti (1600); *Anglica, Hibernica, Normannica, Cambria, a veteris scripta*, an ed. of the works of Asser, Giraldus Cambrensis etc. (1603); *Actio in Henricum Garnetum, Societatis Jesuiticæ in Anglia superiorem et ceteros*, a report of the trial of the conspirators of the Gunpowder Plot (1607); *Annales rerum Anglicarum et Hibernicarum regnante Elizabetha* (1615). He enjoyed the Camden professorship of anc. hist. at Oxford, and in 1883 the Camden Society was founded in his honour.

Camden Town, dist. of London in the metropolitan bor. of St. Pancras.

Camel (Arabic *djemal*), name given to the one-humped Arabian *Camelus dromedarius* (see DROMEDARY), and to the two-humped Asian *C. bactrianus*. The Arabian C. is used in N. Africa and India, as well as in Arabia; it was also introduced into Australia in 1860, and into N. America, but is no longer used in either country. It is not so well able to withstand the cold as the Bactrian C., which has a much thicker coat, and shorter legs, but it is swifter. The C. has a long thigh, which is vertical in position, and this accounts for its peculiar swaying walk. The humps vary in size, according to the condition of the animal; they are reserves of fat and become small and flaccid after many days of hardship and indifferently food. It exists chiefly on the leaves of trees and dry vegetables. The female carries her young for eleven months, and a week after birth the baby C. has attained a height of 3 ft., but it is not full-grown until its sixteenth or seventeenth year. It lives from forty to fifty years. The power of carrying water in its stomach and living on limited quantities of food earned for it the title 'ship of the desert.' While on a journey through the desert a C. will go three days, doing twenty-five m. every day, without water, but on the fourth day it must receive a supply; the swifter breeds, for there are many varieties of the Arabian C., will go much longer, and travel over sixty m. a day without refreshment. If too heavily laden it will sometimes refuse to rise; but while on its journey it bears its burden patiently, and will often only succumb under it to die. If a sandstorm should arise, it falls on its knees, stretches its neck along the sand, and, closing its nostrils, remains in that position until the storm has passed. In character the C. is a wild and savage animal, and it is to the fact of its extreme stupidity and passiveness, and not to any instinct of attachment to its master, that man has been enabled to make it of any service. At times the males become very fierce and dangerous, and make savage assaults on their fellows. It is not until its fourth year that its training as a beast of burden commences; it is then taught to rise and kneel at a given signal, and is accustomed by degrees to carry increasing loads, which may weigh anything from 50 to 1000 pounds, according to the breed of the C. which is used. We have evidence that the Arabian C. were some of the earliest animals used for domestic purposes, for

according to Scripture 6000 of these beasts formed part of the great possessions of Job. They were also included as part of the gift that Abraham received from Pharaoh. The flesh of the C. is a very favourite food among the Arabs; their milk also forms a good and nutritious beverage. The Arabs weave the hair of the C. into various materials for clothing; it is also imported into Europe, and used in the manuf. of artists' brushes. The mounting of infantry on Cs. has proved of great advantage, as it enables the men to reconnoitre in hot, arid countries, where water is not easily found, and where horses are not of much service. European troops have often made use of Cs. in this



BACTRIAN CAMEL

way, when operating in India, Egypt, and the Sudan. In many of the central Asian deserts the Bactrian species is to be found in its wild condition. The C. is classified as an artiodactylate (even-toed) ungulate; like deer and oxen, it has the ruminant type of stomach, and here it stores up water in special cells of the stomach lining. Closely related to the C. are the llama, the alpaca, and other S. Amer. species.

Camel, apparatus used for raising a ship, so as to render it navigable in shallow water, consisting of large hollow vessels attached to the ship's side. Invented by a Russian engineer, De Witte, and much used between Kronstadt and Leningrad.

Camelford is a vil. of Cornwall, England, situated on the Camel, 28 m. to the N.W. of Plymouth. The ruins of the castle associated with the name of King Arthur are situated at Tintagel, 4 m. to the N.W. The pursuits of the inhab. are mainly agric. Pop. 1500.

Camelina, genus of cruciferous plants which belong to Europe and the Mediterranean. *C. dentata* is sometimes found in Britain, where *C. sativa*, gold of pleasure, or Siberian oil-seed, also occurs.

The latter is of humble appearance, has small yellow flowers, and yields a good fibre.

Camellia, Asiatic genus of evergreen trees and shrubs belonging to the family Theaceae, with thick, dark, shiny leaves, and white or rose-pink flowers. Linnaeus so named it after Camellus, or Kamel, a Moravian Jesuit, who wrote an account of the flora of Luzon. There are sev. species, the best known being *C. japonica* and *C. reticulata*. The former originally came from Japan, being introduced into England in 1739. Its flowers are red, and it grows to a height of 30 ft. The latter was brought from China, and is a much smaller plant, with large pink flowers, known as semi-double. *C. oleifera* has sweet-scented white flowers; *C. Sasanqua*, an inhab. of China and Japan, and *C. drupifera*, from Cochinchina and the mts. of India, are both oil-yielding species. The oil of *C. Sasanqua* is in use for many domestic purposes, and has a pleasant odour; it is made by the crushing of the seeds into a coarse powder. The leaves of the plant are also made into a decoction and utilised by the Jap. women for their hair. The oil of *C. drupifera* is used for medicinal purposes. The C. is generally grown in Great Britain under glass, but in the S. parts it does well in the open. They grow to advantage in rich sandy peat and loam, requiring shelter from the cold easterly winds. They are propagated by layers or cuttings, also by seeds. Sev. varieties of *C. sinensis* are cultivated in India, Java, China, and Japan; the leaves are dried and used for brewing a kind of tea.

Camelopard, see GIRAFFE.

Camelopardalis (the Giraffe), constellation near the N. Pole, between Ursa Major and Cassiopeia. It was originally discovered by Jacobus Bartschius, assistant to Kepler, 1624, and added to the astronomical maps by Hevelius (*q.v.*). It contains numerous but no conspicuous stars.

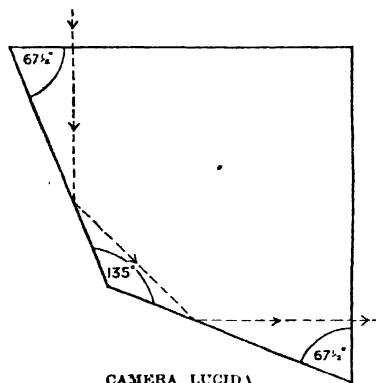
Camelot, name given in medieval romance to the seat of King Arthur. It has been identified with Caerleon-upon-Usk, and also with Winchester, Queen Camel in Somerset, and Camelford in Cornwall. It is mentioned by Tennyson in *The Lady of Shalott* and *The Idylls of the King*, and by Shakespeare in *King Lear*.

Cameo, or **Camaieu** (It. *caméo*, from Med. Lat. *cammaeus*). Origin unknown. The word was in use in the thirteenth century. C. is an engraved gem in which the figures, or subject, is carved in relief, in direct contrast to the intaglio, a gem in which the engraved subject is hollowed out, as in the manner of a seal. It was not until after the time of Praxiteles, the Gk. sculptor, that C. cutting became an art. The stones used for the purpose were brought from the E., and most of them were of magnificent size and colour. Classical and artistic results were in requisition, for the ornamentation of caskets, vases, cups, etc., as well as for personal ornaments. Many of these have been preserved in excellent condition, and

are to be found in various private and public collections. One of the most famous Cs. is the Gonzaga, or Odescalchi, originally in the possession of the Empress Josephine, and later preserved in the imperial cabinet in Leningrad. On it are represented the portraits of Nero and Agrippina. Another smaller but not less valuable C. is that of Jupiter fighting the Titans, by Athenion, A.D. 50, now in the Vatican. The art of C. cutting was revived during the fifteenth century in Italy, and was carried on with great success until comparatively recent times, Piistrucel ending the long line of renowned engravers. The modern C. cutters of Italy, and other places, finding there was great difficulty in treating the hard gems, also being unable to obtain a sufficient supply of the fine ones necessary for the work, began to think of some other method: hence the introduction of shell Cs. The shells of various molluscs are now often used for making Cs., and they are also imitated on glass.

Camera, see PHOTOGRAPHY.

Camera Lucida, optical instrument constructed for various purposes. Dr. Robert Hooke was the inventor of one about 1674, and Dr. William Hyde Wollaston brought out another in 1807. This latter one was intended to facilitate the perspective outline of objects, and consists of a four-sided prism of glass, having one angle of 90° , and the opposite angle of 153° , while the other two angles are each of $67\frac{1}{2}^\circ$. The C. L. was of some

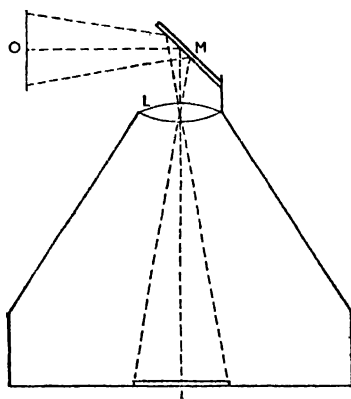


CAMERA LUCIDA

importance to draughtsmen, before photography was used in that capacity, on account of its small size, which rendered it easily portable. Its chief use was in copying, reducing, or enlarging drawings. But it is not an instrument that many have been able to use satisfactorily. An instrument devised by Amici was made with a right-angled triangular prism, involving two refractions and one reflection.

Camera Obscura, an optical apparatus

by means of which the images of objects are made to appear on a light or white surface, or a darkened room in which an image of surrounding objects is projected on to a large screen by a long-focus convergent lens. At the top of the dark chamber is a box containing a convex lens and sloping mirror. If a plane mirror is placed behind the lens at an angle of



CAMERA OBSCURA

O, object; M, mirror; L, lens; I, image.

45° to the horizon so that the rays of light would be reflected vertically downwards, a true image of the object is produced: that is to say, the image appears exactly as the object, and is not perverted, as is the case when an object is viewed in a mirror. This is the principle of the C. O. Its invention has been ascribed to Giovanni Battista della Porta, 1569, but it is a well-known fact that this principle had been recognised, and made use of, many years before his time. The C. O. was first employed in the interests of photography about 1791, by Thomas Wedgwood.

Camerarius, Joachim (1500-74), Ger. scholar, b. at Bamberg. His proper name was Liebbard, but because the office of chamberlain at the court of the bishops of Bamberg was always held by his family, he changed it to C. (Ger. *Kammerer*, late Lat. *Camerarius*). He was one of the most distinguished philological scholars of his time, and improved the organisation of the univ. of Leipzig and Tübingen. He had a considerable part in the preparation of the Confession of Augsburg, 1530, and in 1555 he was deputy of Leipzig Univ. to the Diet of Augsburg. He was a friend of Melancthon, of whom he wrote a biography in 1566. His works were numerous, and include translations of the classics, and monographs on Gk. and Lat. philology and antiquities.

Camerino, tn. of central Italy, S.W. of Macerata. It is situated on an E. spur of

the Apennines, and has a cathedral, a univ. founded in 1727, and silk manufs. Pop. 12,300.

Camerlengo, sometimes **Camerlingo** (It., chamberlain), the cardinal who had charge of the papal treasury during the existence of the papal states.

Cameron, Barons Fairfax of, see **FAIRFAX**.

Cameron, Sir David Young (b. 1865), Scottish painter, b. in Glasgow. Skilled as an etcher. Then took up landscape painting, especially of Scottish scenes. A.R.A., 1911; R.A., 1920. Knighted, 1924. In 1933 he was appointed painter-limner to the king's household in Scotland.

Cameron, Sir Donald Charles (1872-1948), Brit. colonial administrator, son of Donald Charles C. of Brit. Guiana, educated at Rathmines school, Dublin, and entered the civil service of Brit. Guiana in 1890. He acted as colonial secretary of Mauritius between 1904 and 1907; in 1908 he became assistant secretary to the gov. of S. Nigeria and, in 1911, prin. assistant secretary. In that capacity he rendered good service in connection with the development of road and other communications and in making Lagos an open port. In 1914, when Lagos and S. Nigeria were united with N. Nigeria as the colony and protectorate of Nigeria (see **NIGERIA**) with Sir Frederick Lugard as governor-general (see **LUGARD, LORD**), C. was promoted to be secretary to the central gov. When, after the treaty of Versailles, a mandated ter. in the Cameroons was placed under the control of the governor of Nigeria, C., as chief secretary to the governor, rendered distinguished service in shaping the native administration of the Cameroons and in bringing the general administration of the country into line with that of Nigeria. In 1924 C. was promoted to be governor of Tanganyika Ter. where his Nigerian experience made him exceptionally well qualified to administer a country equal in size to Nigeria. Here his name is especially associated with the organisation of a system of native administration known as 'indirect rule' modelled on the principles already in operation in Brit. W. Africa. In the same year he inaugurated the creation of an African civil service, improved the public health service of Tanganyika, and promoted the estab. of gov. schools in that ter. From 1931 to 1935 he was governor of Nigeria. His capacity for work was extraordinary and he combined with it a gift of lucid expression in writing and speech. His own account of his administration was pub. in 1939 in *My Tanganyika Service and Some Nigeria*. K.B.E., 1923; K.C.M.G., 1926; G.C.M.G., 1932.

Cameron, John (d. 1446), bishop of Glasgow and chancellor of Scotland. He became secretary to the earl of Wigtown in 1423, who bestowed on him the rectory of Cambuslang, Lanarkshire. In the following year he was appointed secretary to King James I.; keeper of the privy seal, 1425; keeper of the great seal, 1427; bishop of Glasgow and chancellor of Scotland, 1428.

Cameron, John (c. 1579 - 1625), Scottish scholar and theologian. He was b. in Glasgow, and studied at the univ. there. In 1600 he visited the continent and taught classics and philosophy in many continental colleges, becoming prof. of divinity in the univ. of Saumur in 1618. In 1620 he returned to Britain, and in 1622 became prin. of Glasgow Univ. His advocacy of the divine right of kings made many enemies, and in 1623 he returned to Saumur and thence went to Montauban as prof. of divinity.

Cameron, Richard (c. 1648-80), Scottish covenantor, b. at Falkland in Fife where he became schoolmaster. Converted by the field preachers from Episcopacy, he became an extreme Presbyterian, and preached in Annandale and Clydesdale. In 1678 he went to Holland, and returned in 1680 to take part in the Sanquhar Declaration, for which a price of 5100 marks was set upon his head. He took refuge with some comrades in the hills in Ayrshire, preaching whenever he found an opportunity, until surprised by a party of dragoons at Aird's Moss, and both he and his brother were slain. See **CAMERONIANS**.

Cameron, Verney Lovett (1844-94), African explorer, b. at Radipole in Dorsetshire. He entered the navy in 1857, served in the Mediterranean, the W. Indies, and the Red Sea, and took part in the Abyssinian expedition and in the suppression of the slave trade. In 1872 he was made head of the expedition to relieve Livingstone, and left Zanzibar in March 1873, but at Unyanyembe met Livingstone's followers bearing his remains to the coast. He proceeded to Ujiji, where he found Livingstone's records, and subsequently explored the S. portion of Lake Tanganyika. Afterwards he explored the upper reaches of the Congo, but was prevented from tracing its course to the W. coast owing to the hostility of the natives. He then turned his attention to the Zambesi, of which he discovered the sources, and in 1875 crossed Africa from E. to W., being the first traveller to achieve this feat. In 1878 he explored the route for a Constantinople to Bagdad railway from Beirut to Bushire, and in 1882, with Sir R. Burton, visited the Gold Coast. He wrote among other works, *Across Africa* (1877); *Our Future Highway to India* (1880); and some books for boys.

Cameron Highlanders, Queen's Own. Formerly 79th Foot. Raised 1793 by Lt.-Gen. Alan Cameron who, in that year, raised some 800 young men in his native co. Inverness, and led them in most of the battles of the Peninsular campaign and at Waterloo. Its other campaigns are Crimea, Indian Mutiny, Egypt 1882, Nile 1884-5, S. African 1900-2. During the First World War it raised thirteen battalions, which served in France, Flanders, and Macedonia. In the Second World War the C. H. saw service on all the three major fronts—N.W. Europe, N. Africa, and Italy—and in Burma. As part of the 51st Highland Div. under Maj.-Gen. Douglas Wimberley, the C. H. were in very hard fighting in 1943 at the

battle of Akaret, particularly on April 6 on the Roumana Ridge. Other units were part of the Chindit force, in Burma. Its badge is the thistle ensigned with the imperial crown. The depot is at Inverness.

Cameronians, followers of Richard Cameron (*q.v.*) a Scottish Covenanter, who separated from the Church of Scotland towards the end of the seventeenth century on a question of eccles. polity. The C. refused to recognise the State control over the Church, and adhered strictly to the Solemn League and Covenant, ratified by the assembly of Westminster divines in 1643. They separated from the Presbyterian Church, and were officially known as the reformed Presbyterians. The C. were bigoted fanatics, but undoubtedly acted from high motives. They refused to take the oath of allegiance, and thus cut themselves off from some of the privileges of citizenship. In 1876 the Reformed Presbyterians formally united with the Free Church, who also maintained the spiritual independence of the Church of Christ. There are, however, in the Highlands, a few who still call themselves C. See Walker, *Sir Scots of the Covenant* (repub. in 1901).

Cameronians, The (Scottish Rifles), formerly 26th (1st Battalion) and 90th (2nd Battalion) Foot. Raised in 1689 from the amnestied survivors of the Cameronian covenanter to help William III. against James II. As the earl of Angus's regiment, it served with distinction under William III., and later under Marlborough. For long the 26th regiment of the line, and now the Scottish Rifles. Under Abercromby it gained further laurels in the Egyptian campaign of 1801, and also under Moore at Corunna in 1808-9. In 1881 the 26th and 90th were linked to form one regiment, and as such served in the S. African (1899-1902) war. During the First World War it raised twenty-seven battalions, which served in France, Flanders, Macedonia, Gallipoli, and Palestine. The C. took part in battles in all the major theatres of war in the Second World War. In Burma they were part of the Chindit force of Maj.-Gen. Wingate. They played the chief role in the epic capture of Walcheren and S. Beveland early in 1945, suffering heavy losses in the final stages of the assault when the Gers. rallied to counter-attack. They also took part in the Rhine operations of the Second Brit. Army, notably in March 1945. The depot is at Hamilton.

Cameroon, formerly a Ger. colony on the W. coast of Africa, extending from the mouth of the Rio del Bey to a point slightly below 3° N. lat. Formerly known as the Oil Coast, the ter. was demarcated by treaties between England and Germany in 1893, and between Germany and France in 1885 and 1894; and was increased in Nov. 1911 by acquisition of part of Fr. Equatorial Africa in compensation for recognition of Fr. suzerainty over Morocco. It is a mountainous country, with a strip of low-lying land near the coast. The prin. rvs. are the Lom, Nyory, Lokinya, and Kribi. The

part that was ceded to Germany in 1911 is watered by the Logone, which flows into Lake Chad, and the Sangha, which is a trib. of the Congo. There is considerable rainfall, with no prolonged dry season. At the outbreak of the First World War the Allies decided to deprive Germany of her powerful wireless stations abroad by which she kept in touch with her fleets. With this object in view, a force of Fr., Brit., and Belgian natives, about 4500 strong, was organised under the command of Maj.-Gen. Sir Charles Dobell to destroy the wireless station in the C. The Ger. military resources in the country were estimated at about 6000 native troops. The campaign opened in Sept. 1914, and an attack on Duala was planned. The Gers. protected the tn. by sinking eleven sea-going ships in the R. C. so as to form a barrier which prevented the allied ships from approaching it closer than a distance of 8 m. This obstacle, however, was overcome and Duala surrendered on Sept. 27. The wireless station was destroyed and the object of the campaign achieved. But as the Ger. forces were still at large, the conquest of the whole colony was decided upon. The force therefore moved against Edéa on the Sanaga R. By the middle of Nov. 1200 Gers. had been taken prisoners. The next move was against the railroad, and Bahr, which covers it, was accordingly occupied. During the early months of 1915 reinforcements began to arrive. Jaunde was next attacked, because, on the surrender of Duala, the Gers. had moved the seat of gov. to the former place. In April Gen. Cunliffe from Nigeria joined Sir Charles Dobell's force, bringing reinforcements with him. In Sept. the Brit. force was directed against Jaunde, and were opposed vigorously all along the route, and it was not until Jan. 1, 1916, that the force entered the tn. The Fr. troops arrived on Jan. 5. The enemy troops, pursued by the Allies, escaped into Sp. ter., where they laid down their arms. A small band of Gers. was still gallantly holding out at Mora, but surrendered on Feb. 18. The protectorate was now entirely free of Gers., and in April 1916 practically the whole of the country was handed over to Fr. administration.

By the Milner-Simon agreement of 1919 the whole area was divided into a Brit. sphere of about 31,000 sq. m. and a Fr. sphere of about 143,400 sq. m. and in 1922 the ters. were placed by the League of Nations under Brit. and Fr. mandates. The C. under Brit. mandate marches the entire distance of the Nigerian E. boundary, except for one short break. The C. under the Fr. mandate borders on the Atlantic and has a pop. of 2,514,000 Bantus, Sudanese, Hausas and half-caste Arabs, and some 2000 Europeans. By decrees of 1921 and 1925 the Fr. C. was constituted an autonomous ter., both administratively and financially. The pop. of the Brit. C. is about 831,000. The two narrow strips of ter. extend from the Atlantic to Lake Chad, a distance of 700 m., and lie diagonally between 4°-12°

30° N. lat. and 8° 30'–14° 45' E. long. The nature of the country varies to a remarkable extent, from the coastal mangrove swamps and dense forest region to the grasslands at heights of 400 to 7000 ft., and again to sandy, swampy tracts in the Dikwa country and around Lake Chad. The highest peak is C. Mt., a volcanic mt. 13,350 ft. high. The Brit. C. is administered as part of Nigeria. The N. areas are administered by the residents of the neighbouring provs. of Adamawa, Bornu, and Benue; the S. part forms a separate prov., known as the Cs. Prov., with headquarters at Buea on C. Mt. Cattle raising and the growing of guinea corn are the chief industries of the Dikwa people, who are mainly Arabs and Kanuri. Cs. Prov. is rich with timber, and the volcanic soil of the C. Mt. is especially fertile. The ports Victoria and Tiko are linked to Buea (pop. 3000) by motor road. The exports are cocoa, palm kernels, rubber, bananas, and mahogany. The Victoria dist. contained large Ger. cocoa, rubber, and banana plantations, with some 48,000 ac. under cultivation. They were sold by auction in 1924. Victoria lies amidst fine scenery and has a botanic garden planted by the Gers. Buea was the Ger. administrative cap. The wealth of the forests and minerals is as yet little exploited. There are 315 m. of railways and 13,000 of roads. The Brit. Gov. has announced its intention to place this and other mandated ters. under the trusteeship system estab. in the United Nations Charter (see COLONIAL TRUSTEESHIP). See F. W. Migeod, *Through British Cameroons*, 1925, and Annual Reports of the Colonial Office to the Permanent Mandates Commission of the League of Nations (H.M.S.O.).

Camillus, Marcus Furius (c. 445–365 B.C.), celebrated Rom. patrician and general. He was censor, or, according to Livy, consular tribune, in 403 B.C. In 396 he took Veii, which had withstood a ten-year siege, and in 394 he captured Falerii. Being condemned on the ground of misappropriating the booty of Veii, a decision which was caused more by his unpopular haughtiness than guilt, he retired to Ardea in 391. It is reported that he returned in the nick of time to stop Brennus from taking the Capitol. He opposed the desire of the plebs to move to Veii, and was largely instrumental in rebuilding the city. During subsequent campaigns he vanquished the Æqui, the Volsci, and the Etrusci, and finally, in 367 B.C., the Gauls, near Alba. During his life he was elected military tribune with consular powers six times, and five times dictator. He d. of the plague.

Camisards, insurgent Huguenots or Protestants of the Cévennes, so called from the *camise* or white shirt which formed their uniform. They rose in revolt against the revocation of the Edict of Nantes by Louis XIV. in 1685, and their zeal was fanned by the ruthless dragonnades, or quartering of dragoons upon Protestant households and the accompanying acts of cruelty in order to enforce conversion to the Catholic faith. At first

consisting only of isolated outbreaks, the movement became of greater importance owing to the murder in 1702 of the abbé du Chaila, who for fifteen years had proved the most heartless persecutor of the oppressed people. A general insurrection followed upon this event, and the rebels, now numbering some 3000, were able to maintain themselves in the mts. against the royal forces. The defeat of some small detachments of soldiers led to Marshal Montrevel being sent to the dist. with an army of 60,000 men. The C. were, however, led by a youth of great military capacity named Jean Cavalier, and though the royal army burnt over 400 villages, Cavalier managed to increase the scope of the revolt. In 1704 Montrevel was superseded by Marshal Villars, who wisely adopted more conciliatory measures, pardoning those who surrendered and releasing all prisoners who swore allegiance, while his troops scoured the country in all directions and forced band after band of the insurgents to submit. In May 1704 Cavalier himself accepted the conditions offered, and left the country, with many of the more moderate C. A few zealots still held out, and the rising was renewed in 1705, owing to the severity of Villars's successor, the duke of Berwick, but was put down with an iron hand, and the prov. entirely devastated. Cavalier and many others took service with the Eng. and fought at Alvanza in 1707, where most of them perished. Cavalier, however, came to Britain, and became governor first of Jersey and then of the Isle of Wight. See Anna Eliza Bray, *Recall of the Protestants of the Cévennes*, 1870.

Camlet, cloth made in the Middle Ages from camel's hair, but now usually from the hair of the Angora goat, mixed with silk, wool, cotton, or linen.

Cammaerts, Emile (b. 1878), Belgian poet and author, b. at Brussels, resident in England since 1908. He came into prominence at the beginning of the First World War, with two vols. of Belgian poems, 1915 and 1916—the Fr. being printed side by side with free Eng. trans. by his wife, a daughter of Marie Bremus, the singer. One poem in the second vol., about the Angels of Mons that some people professed to have seen fighting on Belgium's side against the Gers., spread and preserved that legend. A somewhat similar idea was contained in his mystery-play *The Adoration of the Soldiers* (1916), also printed with trans. His pubs. also include four vols. of trans. from John Ruskin and one from G. K. Chesterton, into Fr.; *Les Deux Bossus* and *La Veillée de Noël*, plays (1917); *Through the Iron Bars*, description of two years of Ger. occupation of Belgium (1917); *Messines and other Poems* (1918); *Belgium from the Roman Invasion to the Present Day* (1920); *Poèmes intimes* (1922); *The Childhood of Christ as seen by the Primitive Masters* (1922); *The Treasure House of Belgium*, a guide-book with a vein of historical learning, but mainly concerned with modern affairs—for the author is no worshipper of dead cities (1924); *Les*

Bellini, an essay in art criticism (1927); *Discoveries in England* (1930); *Rubens, Painter and Diplomat* (1931); *The Keystone of Europe* (1939); *The Prisoner at Løken*, (1941); *Upon this Rock*, 1942; *The Devil Takes the Chair* (1948).

Camoens (Camoës), Luis Vaz de (1524-80), most celebrated of Portuguese poets, was descended from an anct. noble and wealthy house. The exact place of his birth is disputed, but it is almost certain that he was b. at Lisbon. By this time the full flood of the Renaissance was making itself felt in Europe, and among other countries Portugal was benefiting from the desire for further and fuller knowledge which seemed at this time to fill all men. C. was educated at the college of All Saints at Coimbra, and steeped himself in the literature and mythology of the classics. He had an excellent memory, and little that he learnt was ever forgotten. His education, however, proceeded on very general lines, and there was practically no subject upon which he was not able to speak with some authority. He knew well the contemporary literatures of Spain and Italy, he had read much hist., and altogether we can say that his great poem *Os Lusíadas* (*The Lusíads*) gives evidence of his universal knowledge. He came then to Lisbon, which city made a firm and lasting impression on him, an impression which in his great poem he immortalised. He found easy entrance into the highest society, and he quickly came to be recognised as a poet of no mean talent. In 1544 he fell violently in love with Caterina de Ataíde, the daughter of a high official at court, who disapproved of his suit. This lady was the inspiration of many of his most impassioned sonnets, and has been aptly described as his Beatrice. He was introduced at court, and here whilst he made many friends he also made enemies, and his too-open passion quickly became a matter of gossip. He left the court, but his voluntary exile was restless; the verses which he wrote at this time show him to be now exuberant now in the uttermost depths of despair. Many of his sonnets and roundels were written at this time, and from this period also date the greater number of his eclogues. He was now also employed in the composition of his patriotic poem, the *Lusíadas*, but his love affairs were still unsettled, and he was finally forced into exile. His exile was hastened by the production of *El Rei Seleuco*. In his place of exile he composed *The Elegy of Exile*, and a number of beautiful sonnets. He now became a soldier, and in 1547 he fought against the Moors, and in an attack on Ceuta lost his right eye. Here he remained for the next two years still pouring forth verses, some despairing and sad, other philosophical; he himself seems to have been buoyed up by the memories of the past. In 1549 he prepared to go to India, and for that purpose returned to Lisbon; once there he found it impossible to drag himself away, and he remained to be near his love. But he indulged at this time in wild extra-

gances which finally landed him in prison, was pardoned, and proceeded to India. He sailed in 1553. In some poems he describes the voyage, which probably was not without its influence on the *Lusíadas*, since after this date the discovery of India becomes the main theme. The Portuguese were at this time dominant in the E., and although C. was well received, he quickly became disgusted with his life at Goa. Between 1553 and 1555 he saw a fair amount of active service, his experiences being described in the *Lusíadas*. He did not, however, stay at Goa, but travelled to many places in the E., usually to perform some military duty. He wrote whilst there *Desparates na India*, *Filodemo*, and *Satyras do Torneio*. He had acquired some little wealth, but now fortune turned against him. After waiting at Macao for a ship to take him back to India, he was imprisoned for intrigue, and he was shipwrecked whilst being brought back a prisoner to India. He managed to save his *Lusíadas*, but remained a prisoner at Cambodia, where he composed his *By the Waters of Babylon*. Still a prisoner he was taken back to Goa, where he heard for the first time of the death of Caterina. It was on this occasion that he produced his famous sonnet *Alma Minha Gentil*. He remained a prisoner for some time, being finally released when a friend of his became governor, and again for a short time he was imprisoned for debt. He was now very poor, but seems to have remained in India living a fairly happy life and working at his chief poem. For three years he was thus employed, and finally the poem was finished, and his ambition became to go back to Portugal and print it. In 1567 he got as far as Mozambique, but here again he was imprisoned for debt for two years, and finally by the charity of friends he was released from prison and sailed for home. He reached Portugal in 1570. He found his mother ready to welcome him; his father was dead, and now, having regained his home, he set about obtaining permission to print his poem. Permission was given in 1571, and the book appeared. It was received with acclamation by everybody. He was granted a substantial pension for three years, a period which was later extended, and he lived for a time in peace and enjoyment. In 1575 he fell, for a short time, into helpless poverty once more, but the renewal of his pension soon set him right again. In 1578 came the disaster of the battle of Alcaer, and C. mourned the loss of his patron and king, Sebastian, in a magnificent sonnet. Early in 1580 the cardinal king d., and C., who saw the vanishing of Portuguese independence, had no further desire to live. In June of the same year the last of a great and illustrious line fell a victim to the plague which was ravaging Portugal. His greatest work was the *Lusíadas* (the *Lusitanians*) for which he has been not inaptly called the Virgil of Portugal. It has for its main theme the discovery of India and the greatness of Lusitania. It is written in ottavaprima, and may be

regarded as Portugal's national epic. C. also wrote comedies, sonnets, eclogues, and elegies. In 1918 a Camoens Chair of Portuguese Language and Literature was estab. in King's College, London. See J. Adamson, *Life and Writings of Camoens*, 1820; Sir R. F. Burton, *Translation of Camoens' 'Lusiad,' with Life and Commentary*, 1880; J. J. Aubertin, *The Lusiads* (trans.), 1884; T. Braga, *Camões e o sentimento nacional*, 1891; E. Prestage, *Minor Works of Camoens*, 1924.

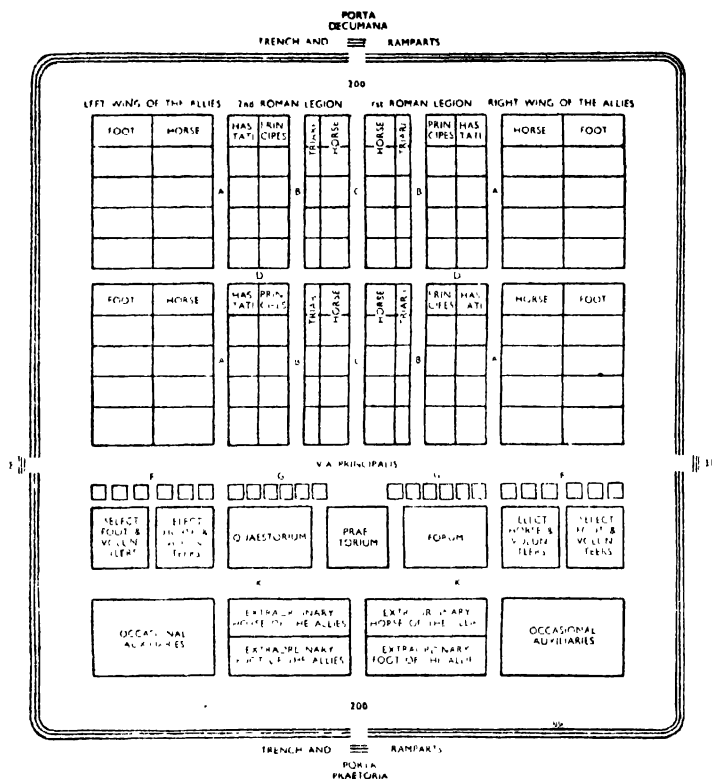
Camomile, or **Chamomile**, genus of Compositæ. It is a herb native to England and W. Europe, and cultivated for medicinal use. It is grown largely at Mitcham in Surrey, where far more valuable plants are produced than any brought from foreign countries; it is also indigenous to Saxony, France, and Belgium. Its flowers in the cultivated state are said to be double, and the most satisfactory results are obtained from the largest, whitest, and most perfected double flowers. The flowers have a very fragrant odour, with an intensely bitter taste. In addition to the bitter extraction that is yielded, the C. also produces about 2 per cent of a volatile fluid, which at first is pale blue in colour, but on exposure to the light it turns yellowish-brown. The odour is fragrant, like that of the flowers, and it is composed of butyl amyl angelates, and valerenes. The most important species of the genus is *Anthemis nobilis*, from which an infusion of its flowers is obtained and used as a bitter stomachic and tonic. In olden times it was used in fevers, but now other more effective remedies are in use. In large doses the infusion acts as a simple emetic. Other Brit. species are of no account; one of these (*A. Cotula*), known as the stinking C. or mayweed, is so pungent as to blister the fingers. A foreign species (*A. tinctoria*) yields by its flowers a beautiful dye. The wild C. (*Matricaria Chamomilla*) is sometimes employed as a substitute for the cultivated species, but it is easily distinguishable, its flowers being single, not bitter, and with less odour.

Camorra (It. *camorra*), secret society estab. about 1820 by prisoners in the Neapolitan dungeons to protect themselves against the brutalities of their jailers. The associates on their release transferred their practices to Naples itself, and in a few years the C. became a powerful organisation, practically controlling the life of the city. Smuggling, robbery, blackmail, all went on under its rules, traders having to pay heavy sums for permission to carry on their business, and the society derived a large revenue from disorderly houses and the promotion of illegal lotteries; but while it remained non-political, it was unmolested by the authorities. Indeed, both ministers and police sometimes invoked its assistance, and men of high station lauded themselves with it. In 1848, however, it adopted revolutionary ideas, becoming a political as well as criminal organisation, and controlling all elections. During the sixties it carried on practically a reign of terror, but after years of struggle its

power was broken by the gov. in 1877. Even then, however, it by no means became extinct. In 1900 so many Camorristi were proved to have attained high offices that the Neapolitan municipality was superseded for some months by a royal commission. In 1901 the Camorrist candidates were utterly defeated by the Honest Government League. Five years later a double murder by some Camorristi led to the arrest of forty conspirators, their chief being Enrico Albano. Witnesses' lives being unsafe at Naples, the court was removed to Viterbo, and the trial took place in 1911, long sentences of imprisonment being awarded to sev. of the accused.

Camouflage (from Fr. *camoufler*, to blind or veil). Although the word C. came into prominence only during the First World War, the principle of deceiving the enemy by artificial aids is very old. The deception most practised is that of so altering the appearance of troops or works as to render them either invisible or to assimilate them to the surrounding countryside. Hence during the S. African war of 1899-1902 Brit. troops were clothed in khaki, and practically all troops throughout the world wear uniform and equipment of a neutral shade. Taking cover by dressing troops in grass, reeds, or branches of trees is a very ancient practice. A good example is referred to by Shakespeare in *Macbeth*, where Macduff's army advances hidden by boughs (see Act v. sc. vi.). C. was fairly easy before the development of aircraft, but during the First World War lines of trenches stood out in the landscape like huge scars and were most difficult to hide. Air power confers great powers of observation upon an enemy, the antidote to which is a better use of C. So important was C. during First and Second World Wars that guns, tanks and vehicles, buildings, tents and marquees, were painted in such a manner as to deceive the observer from the air. C. on the sea was equally important, and the majority of low-powered ships were also painted in such a manner as to make observation from submarines difficult. The particular form adopted was known in the First World War as 'dazzle painting,' which gave a distorted appearance to vessels. Ships with high speed relied upon their speed for security against a submarine attack. During the Second World War C. was extended to all manner of buildings and works in Great Britain as a measure of defence against Ger. air raids. For C. in nature, see COLOURS OF ANIMALS; MIMICRY.

Camp is a collection of tents or huts which is used to lodge soldiers on a campaign or during field manoeuvres. The 'C. of exercise' is slightly different in nature, and will be described later. The size of European armies renders it impossible for tents to be carried for the troops, and cantonments and bivouacs (q.v.) take their place. But when the force is comparatively small, and stationed in a hot country, the troops are still placed under canvas. The space required



ROMAN CAMP ON CASTRA

A, B, C, streets 50 ft. wide; D, street called Quintana, 50 ft. wide, E, porta principalis dextra; F, tents of the praefecti sociorum, G, tents of the tribunes; H, porta principalis sinistra; K, street 100 ft. wide, 200, street (or intervallum) 200 ft. wide.

by a battalion of Brit. infantry at war strength is 190 yds. front and 280 yds. depth. The quarter-guard tents come in the middle of the front; the parade ground, 80 yds. deep, comes next; then the men's tents, followed by the field kitchens, the officers' tents, and the baggage wagons and horses; to the rear of all are the tents of the rearguard. The space required by a cavalry regiment is 188 yds. front and 255 yds. depth. The formation of the tents is similar to that used in an infantry regiment; the horses are fastened by means of picket ropes laid down between the tents. If the camp is required for one night only, less space is required. The space required by a battery of field artillery is 100 yds. front and 180 yds. depth; a similar space is required for each unit of field hospital, engineer,

ordnance store, commissariat, and transport Co. The different Co. are distinguished by various ensigns in the daytime and by different-coloured lamps at night. Thus a field hospital has a white flag with a red Geneva cross, or a red lamp; a commissariat and transport Co. has a blue flag with a white centre, or a green lamp; an ordnance store Co. has a blue flag with a red centre, or a yellow lamp. When near the enemy, or on active service, the tactical considerations are of paramount importance; the Co. must be so arranged that the troops can be in fighting order on the shortest notice. When this is observed, the Co. should also have, if possible, a supply of good water, fuel, etc.; the ground should be firm with good natural drainage; and access should be open to good roads. When a large per-

manent garrison in barracks is visited by regulars and territorial troops during the drill season, for the purpose of combined manoeuvres under war conditions, this is termed a C. of exercise. All the ordinary requirements of a good C. site, as mentioned above, should be complied with, and in addition a wide expanse of fairly wild and changing country is a necessity. The Brit. Gov. has acquired such an expanse on Salisbury Plain, and six Cs. of exercise have been instituted: Aldershot, Colchester, Shorncliffe, Strensall, Salisbury Plain, and Stobs. Artillery of the various grades, field, mountain, siege, and garrison, have Cs. at Okehampton, Hay, Lydd, and Devonport respectively.

Camp, Roman. The Romans were the first nation to carry the act of encampment to any degree of perfection; their camp was the same in outline from the time of Polybius to the fall of the empire, and was in form as follows. The camp was an exact square of 207 Rom. ft. in size. The *via principalis*, or prin. street, was 100 ft. wide, and was situated about two-thirds of the distance down one side. In the smaller portion of the square, facing the middle of the *via principalis*, was the *prætorium*, or consul's tent. There were four gates in the camp, and one at each end of the main street, named *porta principalis dextra* (right prin. gate), and *porta principalis sinistra* (left prin. gate). The gate facing the *prætorium* was the *porta prætorii* (prætorian gate), that at the back the *porta decumana* (decuman gate). The space between the *porta prætorii* and the *via principalis* was occupied by two legions and their allies—15,000 in all. On a level with the *prætorium* were the quarters of the consular guard (horse and foot), the legates, and the quaestor. Behind the *prætorium* were the extraordinary and strangers. The whole camp was surrounded by a *vallum* (rampart) and a *fossa* (ditch); the former was composed of earth from the latter and was surmounted by a palisade.

Campagna, tn. in the dist. of Salerno, Italy, seat of a suffragan bishopric; 16 m. E.N.E. of Salerno and 13 m. S.W. from Conza. Pop. 9400.

Campagna di Roma is an It. region, stretching along the Tyrrhenian Sea from Civitavecchia to Terracina, and having the Alban and Sabine hills as an E. boundary. This tract, which comprises most of anct. Latium, is from 30 to 40 m. wide and about 100 m. long. The lakes of the C. are craters of extinct volcanoes, judging from their conical form and the hard black lava which in some cases forms their shores. The *emissarium* of Lake Albano still answers its original purpose as an aqueduct. The lake of Solfatara is composed of the waters of hot sulphur springs, and has its floor of calcareous deposit. This plain formed in olden times no inconsiderable part of 'the splendour that was Rome,' as is attested by the numerous ruined tns. to be found there. In those times the C. was well populated and very fertile; but it was only by the skill and care of the anct. inhab. that it was made so,

and even then many of the tns. in the dist. were unhealthy at certain seasons, according to Livy, Strabo, Cicero, and others. The main cause, however, of the marked changes, was the increased malignity of malaria. This was doubtless due to the repeated devastations of the land by the Goths, the Vandals, and the Lombards, and more recently by the Normans and Saracens. Since the land belongs mostly to the Church, sev. of the popes have attempted to improve its condition, and the It. Gov. has taken up the problem. Drainage has been attempted, and embankment of the rivs., and large numbers of eucalyptus-trees have been planted. Attempts have also been made to extirpate the anopheles or malarial mosquito. The few inhab. at present on it rear horses, buffaloes, cattle, sheep, and goats; a few cereals and some fruits are grown.

Campagnola, Domenico (b. c. 1482), It. painter, noted for his frescoes in the Scuola del Santo, Florence, and his oil paintings in the Scuola del Carmine. Learned under Titian. His most notable work is the 'Adam and Eve' in the Pitti Palace, Florence.

Campan, Jeanne Louise Henriette (née Genêt) (1752–1822), Fr. authoress, was b. in Paris. She was appointed reader to the daughters of Louis XV. in 1767, and Marie Antoinette later made her first lady of the bedchamber. She kept a school for young ladies at St. Germain until 1807, when Napoleon Bonaparte founded a school at Écouen, and appointed her principal thereof, a post which she held until the abolition of the school by Louis XVIII. She d. at Nantes. Her best-known work is her *Memoires sur la vie privée de Marie Antoinette* (1823).

Campanella, Tommaso (1568–1639), It. philosopher, was b. at Stilo, in Calabria. Whilst still quite young he showed great talent, and was admitted into the Dominican order at the age of fifteen. Like Bacon, of whom he was a contemporary, he 'took all knowledge for his province,' but specialised in philosophy. He was opposed to the doctrines of Aristotle, and in his *Philosophia Sensibus Demonstrata*, pub. at Naples in 1591, he endeavoured to show that philosophy should be grounded, not so much on *a priori* conceptions, as on the observation of the natural world. After travelling to Rome, he proceeded to Florence, where he was well received by the Grand Duke Ferdinand. Returning to Naples in 1598, he was in the following year arrested in Calabria, whither he had gone on a visit, on a charge of conspiracy against the Sp. Gov., which then held sway over Naples. He was accused of having schemed to obtain Turkish assistance in making himself the ruler of Calabria. Though there does not appear to have been any evidence against him, he was imprisoned, tortured, and condemned to perpetual confinement. Whilst in prison he wrote many philosophical treatises. Pope Urban VIII. procured his removal to Rome in 1626, and in 1629 he was set free and given a pension. He betook himself to France in

1634, being afraid of further persecution; he was received with honour by Louis XIII. and Richelieu, and was an honoured figure among the savants of that country. He devoted himself to philosophic studies until his death, which occurred at the monastery of his order in Paris. He attempted to form a philosophy of hist. and politics, the principle of which was the general progress of man leading to a millennium. Among his numerous works may be mentioned *De Sensu Rerum et Magia* (1620); *Civitas Solis* (1643); *Philosophia Rationalis* (1638).

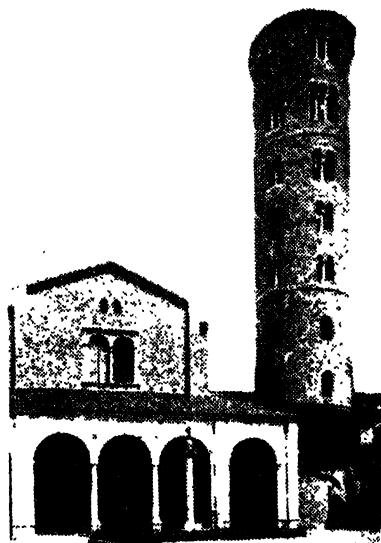
Campanha, city in the state of Minas Gerais, Brazil, 190 m. N.E. of Santos, and about 120 N.W. of Rio Janeiro. It is the centre of a mining dist., and has hot springs in its vicinity. Pop. 15,000.

Campani, Matteo, It. physician of the seventeenth century, was priest of a Rom. par. He was also interested in astrology and astronomy and had great skill in manufacturing the glass for the lens of telescopes. His brother, Giuseppe C., was occupied with similar pursuits, and left works treating of them.

Campania was the anct. name of a prov. of Italy: as a territorial div. it now includes the provs. of Avellino, Benevento Caserta, Salerno, and Naples. The Neapolitan Apennines traverse the region, running parallel to the coast. Though the dist. drained by the R. Sele is rather malarious, the region as a whole is very fertile. The prin. riv. is the Volturno, which flows into the Tyrrhenian Sea at a point midway between the gulf of Gaeta and the bay of Naples. C. has always been densely populated, and the prov. of Caserta is the most beautiful, as it is the most fruitful, part of Italy. The chief products are wheat, maize, wine—the famous 'Falernian' of the Romans—hemp, silk, sulphur, and fruits. The fields of C., with their luxuriant crops, poplar-trees, and canopies of vines, caused Goethe to remark that 'there it is worth while to till the ground.' The area of the prov. is 5214 sq. m. In Rom. times the dist. was the scene of many legends; Lake Avernus and the Sibyl's Cave were situated there. The aristocracy of Rome built magnificent country houses in the interior, to which the Applan and Lat. ways led. The oldest part of all is situated round Cumæ (Κυμæ), a Gk. settlement, and is associated with such names as Cicero, Augustus, Nero, etc. All the names of cities are rich in classical associations—Puteoli, Cumæ, Naples, Salernum, Capua, Beneventum, Nola, etc. Then there are the three unfortunate cities buried in the eruption of Vesuvius in A.D. 79, Herculaneum, Pompeii, and Stabie. Before the time of the Romans, the Oscans, followed by the Etruscans, were masters of the dist.; in modern times it has been part of the kingdom of Naples. Pop. 3,699,000.

Campanile (It. bell-tower, from Lat. *campana*, a bell) is a term applied to the towers which are erected in close proximity, though not attached to, very many churches in Italy. They are of considerable height, usually rectangular, and graceful in design. The leaning

tower of Pisa is perhaps the best known, owing to its remarkable deviation from the perpendicular. It was begun in 1174, the architects being Bonano of Pisa and Wilhelm of Innsbruck. Eight storeys, each surrounded by columns, form the tower, which inclines almost 13 ft. from the perpendicular. Giotto, Taddeo Gaddi, and others designed a C. at Florence in 1334, which rises to a height of nearly 300 ft., and is adorned with many bas-reliefs and statues of an allegorical



E.N.A.

THE BASILICA AND CAMPANILE OF SAN APOLLINARE NUOVA, RAVENNA

nature. The C. of St. Mark's at Venice was the best in design; eight storeys in height, and tapering in design, an open loggia of marble, containing five huge bronze bells, surmounted by a statue of an angel in copper, formed the belfry itself. From base to crown it reached a height of 325 ft.; it was completed in 1349. The belfry storey was added in 1510, after having been commenced in 888, and on July 14, 1902, it collapsed without any warning. Among other examples of Cs. may be mentioned the Torre degli Asinelli, the C. of San Apollinare Nuovo at Ravenna, and the Torre Garisenda at Bologna.

Campanology, see under BELL.

Campanula (dimin. of Lat. *campana*, bell), typical genus of the Campanulaceae, contains between two and three hundred species of plants, many of which

are well known in Britain. The bell-flowers, or bell-worts, as they are often called, are found in colder climates, but in the Mediterranean and other warm regions they occur as Alpine plants. Older names for the genus were *Trachelium* and *Cerricaria*, from the supposed power of many species of curing diseases of the trachea and neck. Campanulate plants are all herbaceous, have usually a milky latex in the stem, and may be annual or biennial, though most of them are perennial. Of them all perhaps the commonest in Britain is *C. rotundifolia*, called in Scotland the bluebell and in England the harebell; the graceful stem and the delicate hue of the flower make it one of the daintiest members of our flora. The flower-juice yields a very good blue ink, and when mixed with alum a green one. *C. pyramidalis*, the chimney plant, is indigenous on rocks and walls in Carinthia, Carniola, and Dalmatia, but is often cultivated for its tall raceme of beautiful flowers, when the plant attains a height of about 3 ft. *C. medium*, the Canterbury or Coventry bell, is a native of central Europe, and is a biennial from which have been obtained many varieties differing greatly in size and colour, and often cultivated in gardens. *C. Trachelium*, the nettle-leaved bellflower, is a European species with large blue bell-shaped flowers; *C. glomerata*, the clustered bell-flower, occurs in England in both a wild and cultivated state; *C. Rapunculus*, the garden rampion or ramps, has an edible root, and the leaves are sometimes used in salads; *C. latifolia*, the giant bell-flower or hark-wort, is found on dry mt. pastures; *C. rapunculoides*, creeping bell-flower, occurs in the N; *C. patula*, the spreading bell-flower, frequents hedges and thickets. *C. muralis*, a tall species; *C. Erinus*, a forked plant; and *C. macrostyla*, a long-styled annual sometimes known as the candelabrum bell-flower, are all further examples of the genus which flourish in Brit. gardens.

Campanulaceæ, family of dicotyledonous plants to which the family Lobeliaceæ is often united. The species are occasionally trees or shrubs, but more often they are herbs with a milky latex; about 1000 known species flourish in warm climates. The calyx consists of five sepals, the corolla of five united petals, the andrœcium of five epigynous stamens, the inferior gynoecium of two to five united carpels, with usually a trilocular ovary, containing numerous ovules. The fruit may be a capsule or, less frequently, a berry. Two of the chief genera are *Campanula* (q.v. above) and *Lobelia*.

Campanularia, genus and family of Hydrozoa, common in European seas. They have stems bearing sporosacs, small bell-like cups containing the zooids or polyps. In some Hydrozoa, these go free as 'swimming bells,' but in the *C.* they are stationary.

Campbell Family. In 1280 Colin Mor C. of Lochawe was knighted by Alexander III., and in 1445 Sir Duncan received a peerage. The earldom dates from 1480, the marquissate from 1641, and the duke-

dom from 1701. The ninth duke of Argyll married Princess Louise, daughter of Queen Victoria. The Cs. of Breadalbane, Cawdor, and London are cadet branches of the great clan.

Campbell, Alexander (1788-1866), Amer. preacher, was b. in Ireland. In 1809 he went to America to join his father, a Presbyterian minister, who had formed a 'Christian Association' at Washington to promote Christian unity on evangelical principles. In 1811 Alexander became minister at Bethany, W. Virginia, and in 1812 succeeded his father as leader of the new church, self-named 'Disciples of Christ,' but generally known as Campbellites (see CHRIST, DISCIPLES OF). Teaching baptism by immersion, he yet fell out with the Baptist churches of Virginia and Pennsylvania, and subsequently with the whole Baptist connection. From 1841 to his death he was president of Bethany College.

Campbell, Archibald, see under ARGYLL, DUKES OF.

Campbell, Sir Colin, Baron Clyde (1792-1863), was the son of a Glasgow carpenter, but his maternal uncle Col. C. provided his education, and in 1808 procured him a commission. He fought at Walcheren and through the Peninsular war, earning a captaincy. After thirty years of active service and garrison duty, he became lieutenant-colonel in 1837, and for brilliant services in the second Sikh war, particularly at Chillianwalla (Chillianwala) and Gujrat (Punjab), was made K.C.B. and appointed in command at Peshawar. Here, in 1849, he spoke of himself as 'old, and only fit for retirement,' but a few years later he commanded the Highland brigade in the Crimea, and won fresh laurels. In the mutiny year, when appointed by Palmerston commander-in-chief in India, he started from London next day, and within a few months stamped out the rebellion. Made Baron Clyde and field marshal in 1858, he returned home in 1860, and was awarded a pension of £2000. Three years later he was buried in Westminster Abbey.

Campbell, George (1719-96), Scottish divine, was b. at Aberdeen, and educated at Marischal College. He was apprenticed at Edinburgh to a writer to the signet, but left the law in 1741 in order to study divinity. He became principal of Marischal College in 1759, and prof. of divinity there in 1771, in which year he also became minister of Grevfriars. The work by which he is principally known is his *Dissertation on Miracles*, a reply to Hume, pub. in 1763. His *Philosophy of Rhetoric*, pub. in 1766, shows sound learning and good critical judgment. His other works include a new translation of the Gospels (1778), and *Lectures on Ecclesiastical History*, pub. four years after his death, in 1800.

Campbell, George Douglas and John, see under ARGYLL, DUKES OF.

Campbell, Gordon (b. 1886), Brit. rear-admiral. In the First World War he was in command of one of the 'Q' or so-called mystery ships, on which he pub. in 1929 a book entitled *My Mystery Ships*. Awarded the V.C. in 1917. After the war commanded, in turn, the *Impregnable* and

Tiger. Rear-admiral, 1928. M.P. for Burnley, 1931, defeating Arthur Henderson.

Campbell, John, Baron (1779-1861), lord chancellor of England, son of the Rev. George C., of Cnpar, became a law student at Lincoln's Inn, and was called to the Bar in 1806. For nine years he occupied himself in reporting *visi prius* cases, which he afterwards pub. with notes. His private practice as a barrister was not very successful, but becoming K.C. in 1827, he entered Parliament as member for Stafford in 1830 and was re-elected in 1831. He made his mark as a practical man of business, and was concerned in many useful measures, mostly connected with the rectification of abuses. He strongly supported Lord John Russell's first Reform Bill, and in 1832 was knighted and appointed solicitor-general. Sitting for Dudley, 1832-34, he was then elected at Edinburgh, and represented that city until 1841, taking part during this period, as a Whig, in many fierce contests, especially concerning the abolition of church rates and the reform of eccles. courts. In 1840, as attorney-general, he conducted the prosecution of Frost and other Chartists, who were found guilty of high treason, and in the following year he became chancellor of Ireland, with the title of Baron C. of St. Andrews. He resigned the chancellorship a few weeks later, and devoted his leisure to writing *The Lives of the Lord Chancellors and Keepers of the Great Seal* (1845-69), a work which brought him both fame and obloquy. While valuable as a storehouse of facts, it is frequently inaccurate, prejudiced, and unfair, especially when its author is referring to his own contemporaries. Wetherell said that C. had 'added a new sting to death.' As a judge he was learned, careful, and honest, but as a statesman wanting in broad and generous views.

Campbell, John Francis (1822-85), of Islay, Argyllshire, Scottish author. He spent a great part of his leisure in collecting and arranging Highland songs and folk-lore and in collecting a large number of legends, which he pub. under the title *Popular Tales of the Western Highlands* (4 vols. 1860-62), also other Gaelic stories and ballads, *Leabhair na Fèine* (*Book of the Fians*), in 1872.

Campbell, John McLeod (1800-72), Scottish divine, son of the Rev. John C. of Kilninver, Argyllshire, was educated at Glasgow and Edinburgh. Soon after 1825 his teaching on the doctrine of the Atonement aroused so much hostility that in 1830 he was charged with heresy. The General Assembly considered the offence proved, and removed him from office. He then went on an evangelical mission to the highlands, and afterwards ministered at Glasgow in a large chapel erected by his supporters. In 1856 he pub. *The Nature of the Atonement*, which was very widely read.

Campbell, Sir Malcolm (1884-1940), Brit. motor engineer who frequently held the world's motor speed record. Sir Henry Segrave (*q.v.*) was the first to reach

a speed of over 200 m.p.h., his time on Daytona Beach, on March 23, 1927, being 203.79 m.p.h. or 29 m.p.h. better than the previous record held by C. On Feb. 19, 1928, C. reached 206.96 m.p.h., which record was beaten by Ray Keech, the Amer. motorist, on April 22, 1928, at 207.55 m.p.h., both performances being on Daytona Beach. Then on March 11, 1929, Segrave reached 232 m.p.h., but was in his turn beaten on Feb. 5, 1931, by C. with 246.15 m.p.h. The 'Blue Bird' Napier-C. motor with which this record was accomplished had been often rebuilt since it was begun in 1924. At Daytona in 1931 he attained a mean average speed of 246 m.p.h., and, in 1933, 272 m.p.h. In 1935 he set up a new world's record, over a measured mile, of 301 m.p.h. Knighted in 1931. In 1937 on Lake Maggiore he estab. a motor-boat record of 129.5 m.p.h. In 1938 in his *Blue Bird* he broke his own speed-boat record by averaging 131.41 m.p.h. for two runs over Lake Hallwil, Switzerland. Held the world's record for the fastest trip on water: this was on Aug. 19, 1939, on Coniston Water, his record being 141.74 (142-85 and 140-62) m.p.h.

Campbell, Mrs. Patrick (Beatrice Stella Cornwallis-West) (1865-1940), Brit. actress, b. in Kensington, Feb. 9, daughter of John Tanner and Louisa R. Romanini; married Patrick C., who was killed in the S. African war in 1900, and then Maj. George Cornwallis-West. Educated in England and in Paris. Gained a scholarship at the Guildhall School of Music. At twenty-three took up acting as a profession, making her first appearance at Liverpool. Between 1891 and 1893 she was in melodrama at the Adelphi Theatre, where George Alexander singled her out for the part of Paula in Pinero's *The Second Mrs. Tanqueray*. This was the part of her life and her performance put her at once in the front rank of Eng. actresses. Success after success now followed under Alexander, Tree, and Hare. In 1895, at the Garrick Theatre, she acted the title part in Pinero's *The Notorious Mrs. Elphinstone*. In a season of joint management with Forbes-Robertson at the Lyceum, she played Juliet, Miltiza in *For the Crown* (John Davidson's rendering of *Pour la couronne*), Magda (Sudermann), Lady Teazle, Ophelia, Lady Macbeth, and Paula. Among other good performances were the Rat Wife in Ibsen's *Little Eyolf* in 1897; Mélisande in Maeterlinck's play to the Pelléas, first of Sir John Martin-Harvey and then of Sarah Bernhardt; Hilda Tesman in *Hedda Gabler*, and Deirdre in W. B. Yeats's play. In 1914 she gave her memorable performance of Eliza Doolittle in G. B. Shaw's *Pygmalion*. In 1917 came *The Thirteenth Chair*; in 1920 George Sand in *Madame Sand*; and in 1929 *The Matriarch*. In later years she was chiefly occupied in film work. In her youth she had a strange disturbing personality and a languorous It. beauty inherited from her mother; but besides these advantages, she had a keen and cutting wit and a strong sense of humour, a beautiful voice and perfect enunciation.

The simpler emotions were not her true sphere, but she could express the passions with rare intensity. Pub. *My Life and Some Letters* (1922).

Campbell, Reginald John, Christian minister, b. in London in 1867; son of a Methodist minister. Educated privately; also at Univ. College, Nottingham. He went to Oxford in 1891—intending to enter the Estab. Church; but he became minister of the Union Street congregational church, Brighton, and, on the death of Joseph Parker, succeeded him at the City Temple, London, 1903-15. He was in the van of the modernisers of Christianity, issued a book called *The New Theology* in 1907, and filled the Temple continually, but the controversy he aroused over these works has long abated. In 1916 he was received into the Church of England. C. was vicar of Christ Church, Westminster, 1917-21. Vicar of Holy Trinity, Brighton, 1921-29. Other publications: *A Spiritual Pilgrimage* (1916), *Life of Christ* (1921).

Campbell, Thomas (1777-1811), Scottish poet, b. in Glasgow. He was educated at the grammar school and univ. of his native tn., and in 1795 went to the is. of Mull as a tutor. Two years later he settled in Edinburgh to study law, but he found the occupation little to his taste, and instead wrote *The Pleasures of Hope*, which appeared in April 1799, and went through four eds. within a year of publication. In 1800 he travelled on the Continent for some months and visited Munich, Leipzig, and Copenhagen. While he was staying at Hamburg he witnessed the battle of Hohenlinden; there, too, he met the hero of his *Epile of Erin*. He contributed articles to the *Edinburgh Encyclopædia*, and ed. the *New Monthly Magazine*. C.'s longer poems, *The Pleasures of Hope*; *Gertrude of Wyoming* (1809); *Theodore* (1824), are not much read now. Their interest lies chiefly in the fame they once achieved. His war songs, *The Mariners of England*, *Hohenlinden*, *The Battle of the Baltic*, are written with a fine energy, and are, for stirring patriotism, unequalled in our language. C. d. at Boulogne, and his body was buried in Westminster Abbey. Works ed. by: Washington Irving, 1810; W. A. Hill, 1851, 1875, 1890; W. M. Rossetti, 1880; J. L. Robertson, 1911. Lives: W. Beattie, *Life and Letters of Thomas Campbell*, 1849, 1850; C. Redding, *Literary Reminiscences and Memories of Thomas Campbell*, 1860; J. C. Hadden, *Thomas Campbell*, 1899; W. M. Dixon, *Thomas Campbell: an Oration*, 1928.

Campbell, William Wilfrid (1861-1918), Canadian poet, b. at Berlin, W. Ontario; educated at Toronto and Cambridge, Massachusetts, and entered the Episcopal Church, but soon resigned. Among his works are: *Lake Lyrics* (1889); *Dread Voyage* (1893); *Mordred and Hildebrande* (1895); *Beyond the Hills of Dreams* (1899); *The Practical Side of Imperium* (1904); *Sagas of Vaster Britain* (1906); *Canada* (1907); *War Poems* (1915).

Campbell-Bannermann, Sir Henry (1836-1908), Liberal Prime Minister. He was b.

on Sept. 7, the son of Sir James Campbell of Stracathro, who was at one time lord provost of Glasgow. C. was the second son, and was educated at Glasgow High School and Glasgow Univ., where he had a brilliant career. After leaving Glasgow he went to Trinity College, Cambridge, where he remained from 1853 to 1858. Both his father and his elder brother were staunch Conservative politicians. In 1868 C. successfully contested Stirling Burghs in the general election which followed the Reform Act of 1868. In 1871 he became financial secretary to the War Office. He was again financial secretary for war, 1880-82, secretary to the Admiralty, 1882-84, and was given Cabinet rank in 1884, becoming chief secretary for Ireland. In 1886 he announced his adherence to his leader, Mr. Gladstone, when the latter declared himself in favour of Home Rule, and was secretary for war in 1886, fulfilling the same office in the gov. of 1892-95. It was the 'corbite vote' in 1895 that led to the downfall of the Rosebery ministry in 1895. The years which followed were years of great difficulty for the Liberal party. For a time it was impotent, and when Harcourt resigned the leadership in 1898, C. was selected for the vacant post. The outbreak of the Boer war, the opposition of C. to the imperial policy of a section of the Liberal party, led to still graver differences, but in 1901 a meeting of the party unanimously confirmed him in his leadership. The controversial measures of the gov. were unpopular, and the tariff reform policy advocated by Mr. Chamberlain gave the Radicals a fine rallying point. The end came in Dec. 1905, when the Unionists resigned and the king sent for Sir H. C. At the election which followed the political pendulum swung, the Liberals winning 379 seats. The prin. measures of his gov. were an Education Bill, an Irish Council Bill, and a plural Voting Abolition Bill, all of which were either rejected or previously altered by the House of Lords. Amongst the important measures which were passed may be mentioned the Small Holdings Act, a Trades Dispute Act, the Patents Act, and the Merchant Shipping Act. But almost immediately after his acceptance of the premiership C. began to fail in health, and to be unable to fulfil the duties of the office, and the leadership of the House passed practically into the hands of Mr. Asquith, and ultimately C. resigned on April 5, 1908.

Campbellites, see CHRIST. DISCIPLES OF **Campbelltown**, seaport in Argyllshire, Scotland, on the peninsula of Kintyre, 36 m. S. of Tarbert. The harbour, sheltered by Davaar Is., is an excellent one; shipbuilding is carried on, and herring fishing. Whisky is distilled and exported, and there are manufs. of woollens. The tn., which was anciently called Dalruadhain, has a pop. of 7000.

Campbelltown, N. Carolina, see FAYETTEVILLE.

Campeachy (sp. Campeche) is the name of a state, a tn., and a bay in the state of Mexico. The state is level in character,

and rice, sugar-cane, and tobacco are grown. Dye-woods, cordage of sisal hemp, cotton, and indigo are the prin. exports. Area of state, 18,087 sq. m. Pop. 90,000. The tn. of C. is situated on C. Bay, 90 m. to the S.W. of Merida. The harbour is safe but shallow; cigars and palm-leaf hats are the prin. manufs. The tn. was founded in 1540 on the side of a vast series of catacombs of the Mayas, and was repeatedly sacked by buccaners. Pop. 18,000.

Camperdown, tn. in Victoria, Australia, 123 m. from Melbourne. Pop. 3500.

'**Camperdown**,' 10,600-ton Brit. battleship, launched in 1885, which rammed and sank the *Victoria* in collision in 1893 (see 'VICTORIA').

Camperdown, Battle of. Eng. naval victory over the Dutch, fought on Oct. 11, 1797, which served to wipe out the disgrace of the mutiny of the *Nore*, the Dutch fleet under De Winter being destroyed. The victor was Adm. Duncan, whose fleet comprised seven ships of seventy-four guns, seven of sixty-four, besides a few frigates and cutters; the Dutch fleet, of four of seventy-four guns, seven of sixty-four, and other smaller ships, being only slightly inferior in strength. Duncan captured no fewer than eleven of the Dutch ships, but the casualties were heavy on both sides. The battle was fought a few miles off the Dutch coast, near the vil. of C., and Duncan in recognition of the victory was created Lord Duncan of C.



Camphor ($C_{10}H_{16}O$), waxy translucent substance closely related to the etheral oils, obtained from the C.-tree (*Camphora officinarum*). It is produced in Japan, along the coast of China, but mostly in the is. of Formosa. The substance is obtained by storing chips of C. wood in earthenware vessels closed at the top, into which a current of steam enters. The C. is volatilised, and passes with the steam to the top of the pots, where it condenses in the form of small white crystals. C. has a sp. gr. nearly equal to that of water, melts at $178^{\circ}C.$, and boils at $204^{\circ}C.$ It is used as an ingredient in many liniments

for sprains, muscular rheumatism, etc. It is also largely used to keep away moths and noxious insects from clothing, furs, stuffed animal specimens, etc. C. was synthesised by Komppa in 1909, and it is now manufactured artificially from turpentine.

Camphoric Acid ($C_{10}H_{16}O_6$), substance formed by digesting camphor with nitric acid. It forms colourless flakes which do not readily dissolve in water.

Camphor Oil, reddish liquid which is produced in the distillation of chips of the C.-tree. The crude product usually contains a quantity of C. in solution.

Camphorsulphuric Acid, $C_{10}H_{16}O \cdot SO_3H$, made by the action of fuming sulphuric acid on camphor, is a white crystalline solid used by Sir William Pope (1870-1939) in his classical researches upon stereochemistry.

Campi, or **Campo**, family of It. artists, of the school of Cremona, their bp.

Galeazzo Campi (1475-1536), the founder of the family. He was a pupil of Boccacino, but his style is in imitation of Perugino. His 'Resurrection of Lazarus' is at Castelmaggiore.

Giulio Campi (1502-72), son and pupil of Galeazzo. He studied under Giulio Romano at Mantua, but modelled his style on that of the great masters.

Antonio Cavaliere Campi (c. 1522-c. 1600), studied with his brother Giulio under Giulio Romano. He painted historical pieces in oil and fresco, modelling his art upon Correggio. His prin. pictures are 'St. Paul raising Eutychus,' an altar-piece of the Nativity, and 'St. Jerome in Meditation' (in the Prado). He was commissioned to paint for Philip II. of Spain at Madrid, and won some reputation as an architect and writer.

Bernardino Campi (1522-1592), was probably related to this family. He studied under Giulio C. and Ippolito Corta at Mantua, and imitated the work of Titian, Raphael, and Correggio. He was chiefly employed in the churches of Italy. In 1584 he pub. a treatise on painting, *Parer sulla pittura*.

Campine, see KEMPEN.

Campion, Edmund (1540-81), Eng. theologian and Jesuit. b. in London, his father being a bookseller. Educated at Christ's Hospital and Oxford. Recanted Protestantism at Douay in 1571 and, seven years later, was ordained deacon and priest by the archbishop of Prague. Came to England on a Jesuit mission and pub. his *Decem Rationes*, against Protestantism. Arrested in Berkshire in 1581, where he had taken refuge on account of the gov.'s proclamation against Jesuits. Committed to the Tower, put to torture, and subsequently convicted on the most shadowy evidence of seditious conspiracy, and hanged, drawn, and quartered. See life by Richard Simpson, 1807.

Campion (Campion), Thomas (c. 1576-1620), Eng. poet and musician. b. at Witham, Essex, and educated at Cambridge and on the Continent; studied law at Gray's Inn, but, discarding it, practised medicine in London. A delicate

writer of vocal music, for lute accompaniment usual at the period; a writer of masques, among the best of their kind; author of many fine lyrics notable for their metrical finish. He also displayed his nimble wit and scholarship in Lat. verse and discussed in prose form the values of music and poetry. His songs are light as thistledown seeming to float away in the air. The best known are *There is a Garden in her Face* (Cherry Ripe) and *My Sweetest Lesbia! Let us Live and Love*, a fine trans. of Catullus's *Vivamus, mea Lesbia*. C. was concerned in five books of airs or three collections: (i) *A Book of Airs*, by Thomas C. and his friend Phillip Rosseter. The words of the second part of this collection, set by Rosseter, do not appear to be by C. The book is dated 1601. (ii) *Two Books of Airs* (Divine and Moral Songs and Light Concepts of Lovers), date probably 1613. (iii) *The Third and Fourth Books of Airs*, which is said to have appeared soon after 1617. He also wrote *Poemata* (Thomas Campian's Poemata), in Lat., which includes occasional poems, elegies, and epigrams (1595). The *Observations in the Art of English Poesy* (1602) is an attack on the use of rhyme and a plea for the adoption of unrhymed metres formed on classical models. (C.'s own *Rose-cheeked Laura*, come in an example. Daniel's *Defence of Rhyme* was an answer to this plea. He also composed the music for most of his songs. His *Collected Works* were ed. by A. H. Bullen (1889). See S. Daniel, *Thomas Campion: Observations in the Art of English Poesy*, 1602; E. Arber, *English Garner: Shorter Elizabethan Poems* (containing the books of airs), new ed., with an introduction by A. H. Bullen, 1903; also *Cambridge History of English Literature*, iv., 141-48.

Campion, popular name of sev. species of *Silene* and *Lychnis*. *Silene latifolia* is the bladder C.; *S. maritima*, the sea C.; *S. acutis*, the moss C.; *Lychnis alba*, white C.; *L. coronaria*, rose C.; and *L. dioica*, red C.

Campoamor y Campoosorio, Ramón de (1817-1901), Sp. poet and politician. b. in the Asturias. In youth it was his aim to enter the Society of Jesus, but he took up medicine as his true calling, and then deserted it for poetry and politics. A zealous Conservative, he served as governor of Alicante and Valencia, and both in speeches and in polemical writings fiercely assailed democracy. But he was not taken seriously as a politician, nor are his essays regarded as of any real importance, his professed 'convictions' being looked upon as only 'occasions for humorous ingenuity.' His ventures into the sphere of drama are by no means remarkable. His two chief plays are *El Pulcero de la Verdad* (1871) and *Dies Irae* (1873), others being *El Honor* (1874), and *Glorias Humanas* (1885); and in the same sphere he wrote *El Drama Universal*, a pretentious poem in eight cantos. His claim to a place in Sp. literature is his invention, as he supposed, of a new poetic genre under the names *doloras* and *humoradas*; but critics have long failed to detect

any genuine novelty in the forms under those names. *Doloras* has been variously defined or described, but the clearest description seems to be that it is a 'transcendental' fable in which the persons typify the 'verities'—palpably unoriginal; while *humoradas* is merely an amplified *doloras*. None the less these witty poems are self-revelatory, and do succeed in attaining brevity, pathos, and refinement in an ironic setting. Withal C., who in his time was the accepted doyen of Sp. literature, was an accomplished craftsman, even if his verse lacks essential poetic feeling, and a colner of brilliant aphorisms and epigrams, even if his philosophy lacks substance.

Campobasso, formerly Molise, is the name of a prov. and tn. in Italy. The prov. extends from the S. Apennines to the Adriatic, and has an area of 1778 sq. m. Sheep and goats are reared, and wheat, maize, and olives grown. The cap. of the prov., C., is situated 50 m. to the N.E. of Naples. It is a fort. tn.; the manufs. of cutlery are considered the best in Italy, and silk, paper, and hats are made. The fourteenth-century church of San Giorgio was severely damaged in the Second World War. Pop. 29,000.

Campo Formio, vil. of N. Italy, 8 m. S.W. of Udine. Celebrated for the treaty of peace concluded here between Austria and France in 1797, when Napoleon, fresh from the subjugation of Italy, threatened Vienna. Pop. 3500.

Campomanes, Don Pedro Rodríguez, Conde de (1723-1802), Sp. statesman, b. in Asturias. He was president of the Cortes, and director of the Royal Academy of History; during his term of office as minister of state he introduced many reforms, such as the opening of Sp. ports to foreign trade, the free import of raw materials, and the institution of a national bank.

Campo y Zabaleta, Conrado del (b. 1879). Sp. musical composer, b. in Madrid. One of the chief figures in modern Sp. music. Possesses a complex musical mind, and though accused of opposition to Sp. traditions, he has been also described as the Sp. Strauss; has a mastery of modern technique and excels in chamber and symphonic music. All his works, and they are very numerous, have been performed in Spain, many having won prizes. Was for many years the viola soloist at Madrid Royal Opera House and the Orquesta Sinfónica, of which he was a founder. Operas and other works: *El Final La Dama Desconocida*; *Leonor Teller*; *Los Amantes de Verona*; *Don Alvaro*; *Tragedia del Beso*; *Dies Irae*; *Avapiés*; *La Flor del Agua*; *La Divina Comedia* (orchestral trilogy with chorus); *Granada y Galicia* (a symphonic poem); *Danza del Nícar* (orchestral); *Kasida*; *Don Juan de España* (orchestral suite); *Aires*, *Atríños*, *Aires* (for orchestra, solo voice, and chorus).

Campus Martius (the plain of Mars) was the name given to a large plain skirting the walls of Rome on the N.E. side; it was called also Campus as being the plain of the city. It was sacred to Mars, and was therefore used for military manoeuvres,

contests, etc. During the later period of the republic it was laid out in walks, baths, etc., and was used as a public recreation ground.

Campus Stellæ, see SANTIAGO DE COMPOSTELLA.

Camulodonum, see COLCHESTER.

Camrose, of Long Cross, first Baron, William Ewart Berry (b. 1879), Eng. journalist and newspaper proprietor; one of a family of three sons of Alderman J. M. Berry of Merthyr Tydfil, Wales. With his two brothers, Henry Seymour, Lord Buckland (killed in an accident while hunting, 1928) and James Gomer Berry (now Lord Kemsley, built up the great Berry brothers' interests of newspaper ownership and big business; C.'s part being mainly on the newspaper side. Editor-in-chief of the *Sunday Times* from 1915. In 1907 he founded the *Advertising World*; later became proprietor of the *Daily Telegraph*, chairman of Allied Newspapers, and other groups of papers. Baronet, 1921; peer, 1929. Did valuable work in the Ministry of Information, 1939.

Camwood, name of a wood obtained from a tree that grows in Africa and Brazil. From it an exceedingly brilliant red dye is obtained, of which the only defect is its lack of permanency.

Cana of Galilee, vil. of Palestine, the traditional scene of Christ's first miracle (John ii.). Now called Kefr Kenna.

Canaan (low lands) was the name which was originally applied only to the low coastland of Palestine, on the Mediterranean, as opposed to the mt. lands (Numbers xlii. 29).

Canada. Before the year 1867 C. was a region which extended from the watershed W. of Lake Superior eastward to Labrador, and had a length of about 1400 m. and a breadth varying from 200 to 400 m. The independent Brit. provs. of Nova Scotia, New Brunswick, Prince Edward Is., and Newfoundland, together with the immense area owned by the Hudson's Bay Company, constituted with C. the Brit. possessions in N. America. Various considerations caused the union of these provs. (excluding Newfoundland) into the dominion of C. in 1867; these reasons will be dealt with in the historical section. The dominion of C. was constituted by the British North America Act of 1867, which united the various colonies of Brit. N. America. The first colonies to unite were upper and lower C., Nova Scotia, and New Brunswick; what had formerly been the Hudson Bay ter. was bought from that company, and formed into the provs. of Manitoba and the N.W. Ter. These were admitted into the confederation in 1870. In the following year Brit. Columbia joined the union, and in 1873 Prince Edward Is. Out of the N.W. Ter. in 1905 were carved the two new provs. of Saskatchewan and Alberta, leaving under dominion administration the dists. of Mackenzie, Keewatin, and Ungava. C., as now formed, is bounded on the N. by the Arctic Ocean, on the W. by the Pacific Ocean and Alaska,

on the E. by the Atlantic, and on the S. by the U.S.A.

The dividing line between C. and the United States is the middle line of Lakes Superior, Huron, Erie, and Ontario, and to the W. of the Lake of the Woods the parallel of 49° N. lat. The middle line of the St. Lawrence as far as the parallel of 45° N. forms the boundary E. of the Great Lakes; then the boundary line runs by that parallel to Hall's Stream, the most westerly of the headwaters of the Connecticut R., and by that stream to its head. The water-parting of the St. Lawrence basin is the continuation of the boundary to about 46° N., when it is continued by arbitrary straight lines between the St. John R., the Grand Lake, and the Croix R. as far as Passamaquoddy Bay on the Atlantic. The whole of the N. part of the continent, including the Arctic Is. W. of Greenland, is Canadian ter., with the exception of Alaska, which belongs to the U.S.A.

Physical Features.—The is. of the Arctic Archipelago are connected with the hist. of commerce and exploration, for a N.W. passage to the E. of Asia was vainly sought for many years among the channels separating the is. Maclure between 1850 and 1853 effected a passage, but the discovery was of no commercial value, as the route is too much hampered by ice. The Atlantic and the Pacific shores are well supplied with deep bays which form magnificent harbours. On the Atlantic coast the chief indentations are the bay of Fundy, which is remarkable for its high tides and 'bores', the gulf of St. Lawrence, and Hudson Bay, which has an area of over 350,000 sq. m. The Pacific coast has no such vast bays, and is smaller in extent than the Atlantic coast, but it is broken up in a noteworthy manner by fjords. There are a good number of is. off the coasts. Vancouver Is. and Queen Charlotte Is. are the most noteworthy off the Pacific coast; Prince Edward Is., Cape Breton Is., and Anticosti on the Atlantic side. Plains and undulating lowlands make up the surface to the E. of the Rocky Mts. Large tracts in the N. are composed of tundras similar to those of N. Russia and Siberia; these descend as far as the 58th parallel on the W. shore of Hudson Bay, and extend still further E. along the whole coast of Labrador. The whole of the dominion E. of Lake Winnipeg, except the area mentioned above and the portions cleared for agriculture, is covered with forests of pines and firs. The prairie lands succeed this region in the W. of the dominion; these are of greatest extent on the tablelands immediately to the E. of the Rocky Mts. The prairie region rises in what are known as the three prairie steps from E. to W. The Red R. valley is the lowest level, with an altitude of about 750 ft.; the surface rises to 1500 ft. W. of that valley, and then extends westwards, forming a terrace of about 250 m. in extent; after that the ground rises rapidly to 2000 ft., then rises in a more gradual slope to the foothills of the Rockies. All the land forming these prairies is of the

highest importance from an agric. point of view, as the soil is fertile and the climate is favourable for agriculture. To the E. of the Great Lakes no outstanding features are to be found. The Laurentian Mts. skirt the St. Lawrence on the N., the S. range terminates in the cliffs of Gaspé.

Lakes, Rivers, and Mountains.—The prin. lakes are: Lake Superior (area 31,800 sq. m.), Lake Michigan (22,400 sq. m.), Lake Huron (23,200 sq. m.), Lake Erie (10,000 sq. m.), Lake Ontario (7,260 sq. m.). The prin. rvs. are: St. Lawrence (length 1,900 m.), Saguenay (405 m.), Ottawa (685 m.), Hamilton or Grand in Labrador which flows into the Atlantic

there are a number of lakes of varying sizes, some joined together, others isolated. The whole area from the lower St. Lawrence to the shores of Lake Winnipeg is composed almost entirely of Archæan rocks. The surface features of this region are similar to those of the unorganised ter. of the N.W., where granite is known to prevail over very large areas. Silurian rocks succeed the Archæan in the E. of the dominion, with one or two patches of Cambrian; these formations extend along a narrow piece of land bordering the St. Lawrence from a little below Quebec and occupying the whole area between the St. Lawrence and lower Ottawa. The area



Canadian Government

BOW RIVER VALLEY, BANFF

Ocean; Dubawni (580 m.), Severn (420 m.), Attawapiskat (465 m.), Albany (610 m.), Big (520 m.), Nottaway (400 m.), Koksoak (535 m.), Kaniapiskau (415 m.), flowing into Hudson Bay; Columbia (465 m. in Canada), Fraser (695 m.), Yukon (1,765 m.), flowing into Pacific Ocean; Mackenzie (2,525 m.), Liard (550 m.), Athabasca (765 m.), Peace (1,065 m.), Coppermine (525 m.), Back's (605 m.). The prin. mts. are: (1) In the Yukon dist.: Logan Mts. (19,539 ft.), Hubbard (16,100 ft.), Vancouver (15,617 ft.), Augusta (14,900 ft.), Newton (13,860 ft.), Cook (13,700 ft.). (2) In Brit. Columbia: Fairweather (15,292 ft.), Columbia (14,000 ft.), Bullock (13,000 ft.). (3) In Alberta: Columbia (14,000 ft.), and Forbes (13,400 ft.).

Geological Formation.—The geological structure of C. is of very great physical features. Archæan and other crystalline rocks extend over very large continuous areas, and where such rocks prevail the earth covering is as a rule only a thin layer spread over a hard foundation. Over this thin earth many rvs. flow with numerous turns and windings, and

between Lake Ontario and Georgian Bay, together with the N. part of Lake Huron, extending nearly as far N. as the Mada-waska R., is composed of the same class of rocks; the S.W. part of the lake peninsula between Lake Erie and Lake Huron is composed of rocks of the Devonian period. Lakes Manitoba and Winnipegosis are also almost surrounded by Devonian rocks. The Archæan rocks near Lake Winnipeg are succeeded by Silurian and Devonian strata, which stretch westwards in strips running parallel with Lake Winnipeg and Lake Manitoba. To the W. of these formations a vast area of Cretaceous deposits is found, of which the precise limits have not yet been determined. Tertiary rocks are found here and there to the westward of the above area, and the geology of the mountainous tract in the W. is much too complicated to be dealt with in detail. Over almost the whole of the dominion glacial deposits are found, and in some places there are aqueous deposits; the rich soil of the Red R. valley in Manitoba is formed by aqueous deposits.

Climate.—The climate of C. is characterised by greater extremes of heat and cold than that of Great Britain, but is healthy on the whole. E. of the Rocky Mts. the climate of the dominion has those extremes of temp. which are prevalent all over the N. hemisphere in the same lats., save in those regions which are exposed to S.-westerly winds from the sea. The difference in the climate of W. C. and Europe is mainly due to the fact that the area between the Rocky Mts. and the Pacific is mountainous in character, and the mts. extend at right angles to the prevailing winds and parallel with the coast. For this reason great contrasts both of rainfall and temp. are found close to the Pacific. The total precipitation is very scanty to the E. of the Rocky Mts. as far as E. Assinibola, when it begins to increase again. Since the future of the Canadian W. still depends largely on its cultivation of wheat, the peculiarities of the climate as affecting this industry must be borne in mind. Most of the total precipitation takes place during the summer months; a considerable proportion of the precipitation is in the form of snow. This is the case throughout the dominion of C., but in a much greater degree in the E. than in the W. From this snowfall springs in each part of the country a different advantage for the cultivation of wheat. The great advantage of the snow in the E. region, where the precipitation is distributed more equally throughout the year, is that it protects the ground against the severe frosts. Therefore in those regions 'fall' or winter wheat can be grown. In Manitoba, Saskatchewan, and Alberta the frost precedes snow, and spring wheat only can be grown. But the melting of the frozen water in the spring furnishes moisture at the time when it is wanted, save in the very dry parts of this region, where irrigation is receiving the attention of the gov. as well as of private individuals. The rainfall does not determine the amount of the produce so much as whether or not frost occurs before harvest. The risk of crops being ruined in this manner is being lessened by the careful choice and cultivation of hardy varieties of wheat, which ripen quickly. Spring in C. commences in April, two or three weeks later than in England, but by the middle of July the crops of the latter country can claim no advantage in their condition. June, July, Aug., and Sept. may be said to constitute the summer, and from Oct. to the middle of Nov. is the autumn. The remaining portion of the year, from the middle of Nov. to the end of March, is the winter. Although cold temps. are frequently found, the Canadian air is generally dry and exhilarating, and the climate in consequence salubrious. The temp. in the winter in dists. near to the mts. is mitigated by warm winds, which blow from the S.E., S., or S.W. on the westward side of the Rocky Mts., and from the S.W., W., or N.W. on the E. side. These winds are known as chinook winds, and they account for stock-raising being an important industry in Alberta,

as these winds cause the cold of winter to alternate with periods of warm weather when the ground is cleared of snow, and the grasses flourish.

Canals and Waterways.—Canals were the earliest large transportation works in C. One of the first locks was a small one constructed by the Hudson's Bay Company at Sault Ste. Marie which was destroyed by U.S.A. troops in 1814. Another was built at the Lachine rapids in the St. Lawrence above Montreal in 1825, followed by the Welland Canal in 1829 to overcome the obstacle of Niagara Falls. The Rideau Canal (military in primary purpose), the St. Lawrence system, and the Chambly Canal followed. To-day there are six canal systems under the dominion department of Transport, namely (1) between Fort William and Montreal, (2) from Montreal to the international boundary near Lake Champlain, (3) from Montreal to Ottawa, (4) from Ottawa to Kingston, (5) from Trenton to Lake Huron, and (6) from the Atlantic Ocean to Bras d'Or lakes to Cape Breton. These canals have opened to navigation from the Atlantic about 1890 m. of waterways. Under the dept. of Public Works or other authority are minor canals and locks to facilitate local navigation on disconnected waterways. Among projected canals the most important are those connected with the deepening of the St. Lawrence waterway. The Great Lakes and St. Lawrence R. form one of the busiest waterways in the world. More traffic passes up and down the Detroit R. than any other waterway, and the traffic through the canals at Sault Ste. Marie in 1929 reached a peak of 92,617,000 tons, more than through the Panama and Suez Canals combined. The greater part of this traffic is iron ore from Lake Superior to the U.S.A. ports on Lake Erie and return cargoes of coal, and grain down-bound destined to St. Lawrence ports, Buffalo, Port Colborne, and other lower-lake ports. The maximum draught of vessels plying between the lakes is governed by channels in the Detroit and St. Mary's Rs., and is limited to about 21 ft. Since 1931 when the New Welland Ship Canal, with 25 ft. in the stretches between locks (the locks have 30 ft. of water above the sills) was opened large upper-lake vessels have passed down as far as Prescott. The St. Lawrence canals have a depth of 14 ft. (reduced in periods of low water) so that ocean vessels, except of very small tonnage, cannot sail up into the lakes; a few such vessels have been engaged in the Lakes traffic for sev. years, bringing over cargoes from European ports. Traffic using the St. Lawrence canals reached a new high record in 1937, with 9,195,400 tons despite a relatively light movement of wheat. About a third of the St. Lawrence and Welland Canals traffic is grain and other agric. products. Canal traffic in 1943 and 1944 averaged 21,000,000 tons (Welland Ship, 10,000,000 tons; St. Lawrence R., 6,148,000 tons; Sault Ste. Marie, 4,569,000 tons; Richelieu R., 288,000 tons).

Railways.—Transportation has always, in spite of the great achievements of engineering skill in C., presented difficult problems in that country. In the pioneer days, when communication was principally by the rivers, difficulties of navigation on the St. Lawrence, which reaches into the centre of C., were multiplied by the frequent falls and rapids. The earliest heavy expenditure for public works in C. was in respect of canals; then came the era of railways, and with it the problem of overcoming sections of rough and difficult terrain, which even to-day, of course, offer problems for solution by the transportation engineer. The periods of rapid railway development were always attended with striking results in the general economic conditions in C. Railways are of supreme importance to the country, and it is significant that the two great systems, the Canadian Pacific Railway and the Canadian National Railways, are the largest single employers of labour in the dominion. The first Canadian railway was constructed in 1836 between St. John's and La Prairie. It was at first operated by horses, locomotives being substituted in 1837. By 1850 there were only some 60 m. of railroad in C. With the inauguration of the Grand Trunk system, and subsidiary lines, development was accelerated, and by 1864 the total mileage had reached 2200, the Intercolonial, which joined the Maritime provs. and Quebec, being an integral part of the Confederation compact. With the completion of the Canadian N. Railway and the Grand Trunk Pacific in the twentieth century, C. possessed the most extensive railway system of any country of its pop. The total single track mileage of steam railways in operation to-day (1948) is 42,335. The total mileage, including second track, and sidings, is slightly over 57,000. The money invested in the thirty-five Canadian railways amounts to \$3 000 000 000, the gross earnings being \$288 000 000. The tonnage of freight, which in 1875 was 5 600 000, is now upwards of 120 000 000. The Intercolonial and the Prince Edward Is. were always owned by the dominion gov. In 1915, on the failure of the Grand Trunk Pacific to take over the National Transcontinental Railway from Moncton to Winnipeg, the gov. undertook its operation, as well as that of the Lake Superior branch of the Grand Trunk Pacific. In 1917 the gov. acquired the capital stock of the Canadian N. Railway Company, and in 1919 the Grand Trunk was included in the gov. railway system, which in 1922 was consolidated and reorganised under a single national board, the Canadian National Railways (C.N.R.). This system controls 23 687 m. of railway, the largest single system in N. America, and it includes Quebec Bridge (central span, 1800 ft.), next to Sydney Bridge, the longest in the Brit. Empire. The Canadian Pacific Railway has 17 038 m. of railroad, and has subsidiary steamship lines on the Atlantic and Pacific, thereby ranking as one of the great trade routes of the world. The Canadian Pacific Railway has an

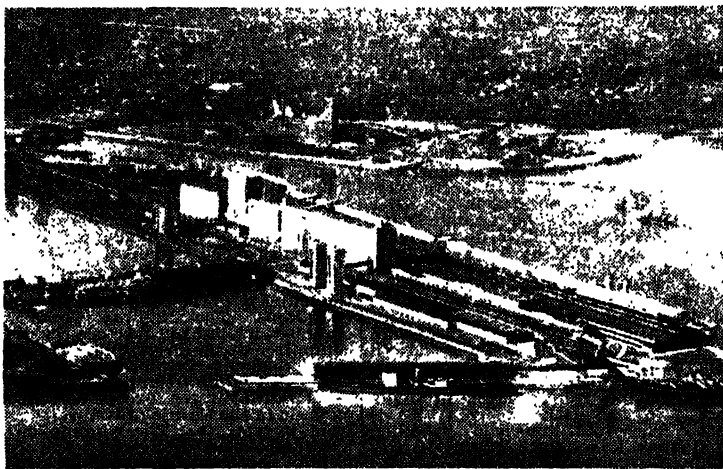
advantage over its older rivals, the N. Pacific and the Union and Central, in the lower height of its passes and the shorter length of route at high levels; though the Canadian National Railway (4518 m.) has as good a route on the whole as the Canadian Pacific Railway. These two railways jointly own the N. Alberta, with 923 m. of road, and the Toronto Terminals with 3 19 m. The Canadian National operates the Hudson Bay Railway, with 510 m. of road, for the dominion gov. and owns the Central Vermont with 25 m. of road in Canada, and the Thousand Is. Railway with 4 5 m. U.S.A. railways operating in C. account for 863 m. and, of the remaining 1891 m., the provincially owned roads, the Temiskaming and N. Ontario and Nipissing Central, in Ontario with 574 43 m., the Pacific Great E. with 347 8 m. in Brit. Columbia, and the Greater Winnipeg Water Dist. with 92 m., owned by the city of Winnipeg, account for over half. Thus 23 810 m., or 56 per cent of the total miles of railway in C., are publicly owned. Under the agreement between C. and the newly created prov. of Newfoundland, C. takes over the Newfoundland railway (including some marine services). There are over 700 m. of gov. railway line in Newfoundland. The lines constituting the Canadian National and the Pacific Great E. were taken over by the dominion and prov. govts. because of the inability of the companies to continue operations. The Railway Commission, organised in 1904 to supersede the railway committee of the Privy Council, and now the Transport Commission, has jurisdiction over all freight, passenger, and other railway rates, except certain rates on grain in the Prairie provs. which are all fixed by statute. The commission also has jurisdiction over safety features of railway operations, the train service, and the abandonment of services and track and other relevant railway activities and jurisdiction over rates for certain waterborne traffic.

Electric Railways and Roads.—There are now some thirty-seven electric railway companies in operation, owning 1771 m. of track. The total investment in electric railways is about \$205 000 000. The highways in C. are becoming increasingly important every year in the economic life of the dominion; and over them passes a very heavy passenger and freight traffic. Since the advent of the motor vehicle, and more especially since 1919 when the dominion gov. made a grant to the provs. of \$20 000 000 for the construction of roads and to relieve unemployment, the mileage of paved highways has increased rapidly each year. For the seven years, 1929-35, the average expenditure on rural roads was over \$73 000 000, exclusive of some expenditure on local roads by rural municipalities. These expenditures ranged from \$93 000 000 in 1930 to \$40 500 000 in 1933. The mileage of surfaced roads during these years increased by 19 000, amounting to 125 000 in 1944. The number of motor vehicles registered in

C. in 1906 was 1447; by 1916 it had increased to 128,328; by 1926 to 832,268, by 1946 to 1,622,400. This extensive use of motor vehicles is revolutionising conditions in C. as in other countries. The passenger travel by steam railways has declined rapidly, but the total travel has probably increased many times during the past two decades.

Air Navigation.—The aeroplane has provided a vastly improved means of transportation in the undeveloped N. areas of C., where the only alternatives were canoe in summer and dog team in winter. Air travel soon proved not only much quicker, but much cheaper, and a

tate progress along this line. This airway began experimental flights between Vancouver and Winnipeg on Jan. 1, 1938, and two months later a start was made in transporting mail over this portion of the airway, while by Oct. modern aids to air navigation, including night-flying facilities, were completed and a regular air-mail service was instituted. On Oct. 17 an express service was extended to Toronto and Montreal, and before the close of the year a daily air-mail service was estab. between Vancouver and Montreal. Services were also estab. between Lethbridge and Edmonton, and from Regina to Moose Jaw, Saskatoon



Compagnie Aérienne Franco-Canadienne

QUEBEC: DOCKS AND GRAIN ELEVATORS AT THE MOUTH OF THE
ST. CHARLES RIVER

rapid expansion took place without the aid of gov. subsidy. The mileage flown by aircraft was 185,000 in 1922. In 1946 Trans-Canada Air Lines, the national air service, flew 14,162,300 m., carrying 305,400 passengers. Other air carriers, including the Canadian Pacific Air Lines, transported 18,344,600 lb. of freight and 4,811,800 lb. of mail. Furthermore, the aeroplane has proved a great boon in the administrative sphere in C. in developing and conserving the vast natural resources of the country. Aerial forest fire patrols are now conducted over large parts of almost every prov.; fishery patrols by aeroplane protect territorial waters and enforce fishing regulations, and aeroplanes, equipped with special cameras, make rapid preliminary surveys over large tracts of difficult country. This is a special development in C., for in other countries air traffic between the chief centres of populations has generally received most attention. The Trans-C. Airway is designed to facil-

itate progress along this line. By 1939 there were in operation thirty radio range stations at approximately 100-m. intervals except in the mt. section where the spacing is closer. Adjacent to most of these are airports fully lighted for night-flying. Meteorological services provided weather maps four times a day, and dist. forecasts for the ensuing six hours. The service on the section E. of Montreal was subsequently extended to Moncton.

When the Second World War began, civil aviation was playing an ever greater part in the daily life of the nation. The plane was taking a leading part in mail deliveries in all areas; in transporting passengers and goods to the outposts; in photographing and mapping uncharted areas; in exploring and prospecting; in the transport of hunters and trappers to inaccessible areas; and in taking tourists into the remotest parts for hunting and fishing. In addition to these activities, there was a development of inter-city air traffic on a large scale from ocean to

ocean. The Second World War necessitated the suspension of all these activities in the interest of national defence; but during the war period the position of Canada in the air was enormously strengthened by improved technology and a great increase in the numbers of trained personnel, and also by the efficient organisation built up. The successful progress of the war in Europe in 1944 made it possible to curtail the Brit. Commonwealth air-training plan (See AIR FORCE, ROYAL), and this meant that a number of air ports became available for civil flying. In the development of the N.W. airways system, the operating of the N.W. staging route is important, this being the main artery for air traffic between the U.S.A. and Alaska, and beyond to N.E. Asia. This route is Canadian property and was initially built, developed, and operated by C., and subsequently improved with the co-operation of U.S.A. army engineers and workmen. The possibilities of an airway connecting with the trans-C. system at Edmonton to give access to all parts of N.W. C. and Alaska had long been appreciated. The survey parties were still in the field at the outbreak of the Second World War, but it was decided not to abandon the project despite the existence of possibly more urgent needs, but to expedite the completion of the route, and this decision was justified by subsequent events. The total cost of the war-time development of this route was nearly \$60,000,000. During the war, with the completion of Goose Bay air base by C. and the Greenland and Iceland airfields by the U.S.A., a staging route was available for short-range aircraft in the N.E., but later all routes were organised over N.E. C. to ferry long-, medium-, and short-range aircraft to Europe.

Telegraphs, Telephones.—To-day there are over 55,750 m. of telegraph lines in C. Six trans-oceanic cables terminate in C.—four on the Atlantic and two on the Pacific. There are also eighteen other cables from Atlantic ports to Newfoundland, St. Pierre and Miquelon, Bermuda, and U.S.A., and Canadian ports. Radio telephony has also been estab. Though the telephone was invented in C., telephone development in C. dates only from 1880. To-day there are over 1,848,000 telephones in the dominion (plus about 12,000 operated by the Avalon telephone system of Newfoundland), and there are well-organised gov. systems in the Prairie provs. and in Newfoundland. C. has more telephones *per capita* than any other country except the U.S.A. The first exclusively Canadian postal service dates from 1788, when a monthly courier route from Halifax to Quebec was estab. In 1851 the post office was transferred from the control of the Imperial Dept. to the provs., and at Confederation, the provincial systems were transferred to the dominion, when the domestic rate on letters was reduced from 5 cents to 3 cents per 1 oz.; in 1897 it was further reduced to 2 cents per oz. To-day the post office is under a special dept., the dominion

being divided into fifteen dists., which embrace a ter. more extensive than that served by any other systems in the world except those of the U.S.A. and Russia.

National Radio.—The Canadian Broadcasting Corporation, estab. on a basis similar to that of the Brit. Broadcasting Corporation, replaced the Canadian Radio Broadcasting Commission on Nov. 2, 1936. It has a board of nine unpaid governors (appointed for three years in rotation), which acts as 'trustee of the national interest in broadcasting,' and is responsible for the policies of the corporation. It is thus the guarantee to the public that broadcasting is administered in a non-partisan and business-like manner. The corporation is responsible to Parliament through the minister of transport. In 1938 two 50,000-watt transmitting stations were installed, the first high-power transmitters in C.—C.B.I. at Hornby, Ontario, serving the prov. of Ontario, and C.B.F. at Verchères, Quebec, for the prov. of Quebec. Similar transmitters were later constructed at Aulac, Cole's Is., New Brunswick (C.B.A.) to give coverage in the Maritime provs. and C.B.K. for the Prairie provs. In addition to the stations owned by the Canadian Broadcasting Corporation, the national network includes a large number of privately owned transmitters. Close relations have been estab. with U.S.A. broadcasters, and exchange of programmes by U.S.A. networks has met with increased success.

Shipping.—The tonnage of sea-going vessels entered and cleared at Canadian ports showed a continuous increase up to 1914 and again after the First World War. The increase in sea-going and inland international tonnages was from 13,000,000 in 1868 to 83,000,000 in 1928. The tonnage of coasting vessels increased from 10,000,000 in 1876 to 89,000,000 in 1928. The number of vessels on the Canadian shipping registry was 8573 in 1919; by 1935 the number had increased to 10,127 representing 1,274,100 tons. At present the registry has 9369 sea-going and inland vessels, representing a total net tonnage of over 1,645,200. Additionally to this there are 2383 vessels representing over 106,300 tons in Newfoundland. In the seventies, shipbuilding was an important industry in C., especially in the Maritime provs., the vessels built being mostly wooden sailing vessels. The invention of the iron steamboat caused a decline in the trade, and the number of vessels built and registered declined each year from 1885 to 1914. But the First World War stimulated shipbuilding. During 1927, fourteen steel vessels of 23,800 tonnage and seventy-four wooden, of 4977 tonnage, were built in C. The value of production in the shipbuilding industry in 1936 was \$6,250,000. The Canadian shipbuilding programme during the Second World War was a major phase of the war effort of the United Nations and its cost approximated by 1943 to \$1,300,000,000, and in 1944 the industry employed more than 100,000 persons, and there were more than fifty

berths capable of handling large ships. Up to 1944 (autumn), 1000 vessels had been launched, including 352 freighters, tankers, victualling ships, etc.; 500 combat vessels and naval craft, ranging from torpedo-boats to tribal destroyers; and 148 special vessels, such as transport ferries, base ships, salvage vessels, railway barges, and sett steel tugs.

Fisheries.—C.'s fishing-grounds are perhaps the most extensive in the world. They comprise the bay of Fundy, 8000 sq. m. in extent; the gulf of St. Lawrence, over ten times that size; and other ocean waters, of a total area of 200,000 sq. m., or four-fifths of the fishing area of the Atlantic. In addition, there are 15,000 sq. m. of Atlantic inshore waters controlled entirely by the dominion, Hudson Bay, and the Pacific coast. The quality of the product is yet more important than the extent of the grounds, owing to the purity and coldness of the waters. Canadian cod, halibut, herring, mackerel, whitefish, and salmon are the equal of any in the world. Fishing was the first industry to be systematically followed by European settlers in what is to-day Canadian domain. Cape Breton, one of the oldest place-names in America, is a memorial of the early French fishermen. The present fishing industry of C. is the growth of the past sixty years. In 1836 fish production in what now constitute the Maritime provs. had an estimated value of \$1,000,000, while that of Lower C. was about \$1,000,000. In the nineties it passed \$20,000,000, and in 1911 \$34,000,000; but the highest record was reached in 1918 with \$60,000,000. Since then there have been sharp decreases, due to lower prices rather than to any decrease in the quantity of the catch. In 1939 the figure was \$40,000,000. Prices rose, and the figures for 1940-43 were, respectively, \$45,000,000, \$62,000,000, \$75,000,000, and \$85,000,000. Of the figure \$35,000,000 the shares of the provs. were as follows: Brit. Columbia, \$32,479,000; Nova Scotia, \$21,684,000; New Brunswick, \$11,129,000; Quebec and Ontario each over \$5,000,000. The above figures (exclusive of Newfoundland) represent the total value of fish marketed, whether in a fresh, dried, canned, or otherwise prepared state. The figures for the prov. of Newfoundland were: 1939-40, \$8,100,000; 1940-41, \$9,735,000; 1941-42, \$12,656,000; 1942-1943, \$12,057,000 (nine months only); 1943-44, \$18,486,000; and 1944-45, \$21,869,000. The hist. of the Newfoundland fishery during the past fourteen years shows how sensitive the industry continues to be to political and economic changes in its overseas markets (see NEWFOUNDLAND).

Formerly the cod and haddock of the Atlantic were the most important fish; to-day Brit. Columbia, with its great salmon and halibut fisheries, leads among the provs. and accounts for nearly half the entire dominion catch. The lobster fishing industry in the E. has also become of increasing importance, and is now the largest in the world. Great improve-

ments have been effected in the methods of catching and preparing the fish, especially by the development of the canning industry. There are over 200 fish-curing estabs. besides 130 (1943) lobster canneries, 32 salmon canneries, 51 sardine and other fish canneries, and 60 fresh-fish and freezing plants; the salmon pack amounted, in 1920, to 2,000,000 cases of 48 lb. each. In 1949 the Dominion's resources were increased by the processing and canning plants, together with eight fish refrigerating plants, in Newfoundland (besides a number of small bait fish refrigerating plants owned by the Newfoundland Gov.). In the primary operations of catching the fish the capital represented by boats, equipment, etc., is now \$31,000,000, of which \$25,000,000 are invested in the sea fisheries and over \$6,000,000 in the inland fisheries. Employees in these operations in 1943 numbered 15,500; and in the secondary operations of canning and curing the capital invested is some \$31,000,000 and the number of persons employed over 16,000. The above figures do not include Newfoundland, the protection and encouragement of whose fisheries was taken over by C. under the agreement of 1948. In 1945 there were 19,650 men employed in the inshore fishery of Newfoundland and 1039 in the deep sea fishery, besides 4117 in that part of Labrador which was then Newfoundland ter. The trade depends chiefly on foreign markets, and in 1943 the total exports amounted to over \$57,000,000. In 1945 the value of fish exports was \$80,225,600 (excluding Newfoundland, the figure for which, in 1945-46 was \$29,697,000. From 60 to 70 per cent of the ann. catch is an average export, of which the U.S.A. takes approximately one-half and the United Kingdom one-fourth. The most important single export is canned salmon (to the United Kingdom and European markets), followed by fresh lobster, canned lobster, fresh salmon, fresh whitefish, and dried cod (to the W. Indies, S. America, etc.). For fresh fish the U.S.A. is the chief market, although (in normal times) the United Kingdom takes considerable quantities of salmon and halibut, classified as fresh and frozen. Exports from Newfoundland consist almost entirely of fish and fish products (apart from newsprint) but in the early 1930's they suffered a serious decline. From 1934-39 dried, salt bulk, pickled and soft cured codfish accounted in each year for some two-thirds of the total value of the fishery. Newfoundland's chief markets were in the Iberian peninsula, Italy, Greece, etc., but political events and the competition with Norway seriously affected these markets (see further under NEWFOUNDLAND).

The dominion dept. of fisheries, estab. on a separate basis in 1928, controls the tidal waters of the maritime provs. and Brit. Columbia, the fisheries of the three prairie provs. and the fisheries of the Magdalen Is. in Quebec prov. The non-tidal fisheries of the maritime provs. and Ontario and both the tidal and non-

tidal fisheries of Quebec (except the Magdalen Is.) are controlled by the respective provs., but the right of fisheries legislation for all provs. rests with the dominion gov. The main object of legislation has been the prevention of depletion, the enforcement of close seasons, the forbidding of pollutions and obstructions, and the regulation of nets, gear, and of fishing operations generally. The gov. has also taken steps from time to time in the field of direct assistance to the industry, including the broadcasting by radio of reports of weather probabilities, bait and ice supplies, and prevailing local market prices; the payment of bounties (under the Washington treaty); and instruction in improved methods of curing fish.

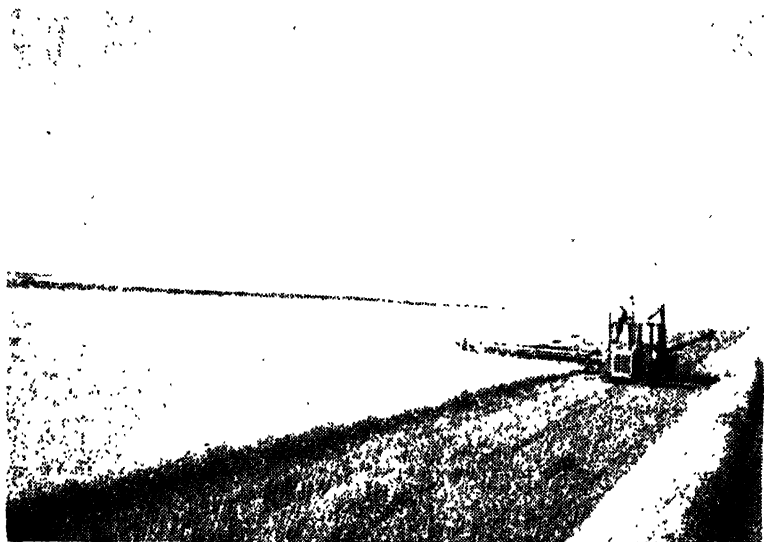
Minerals and Mining.—The mineral resources of C. are very large, though not by any means fully developed. The mining industry is fourth in importance among the dominion's activities, being exceeded in value only by manufacturing, agriculture, and forestry. Thirty-five per cent of the freight tonnages moved in C. are to and from the mines. There are coalfields of very large extent, though they are as yet worked only in the neighbourhood of seaports, such as Vancouver Is. and in the N. of Nova Scotia, or at various points on the route of the Canadian Pacific Railway. It is this deficiency that accentuates the economic importance of C.'s turbine horse-power installation, which on a *per capita* basis is nearly five times the installation of the U.S.A.; and the importance of what is eloquently called C.'s 'white coal' is emphasised when it is pointed out that the chief bituminous deposits of the dominion are in the extreme E. and W., and that Quebec and Ontario at present are mining no coal, though they have 60 per cent of the manufs. of C.; and the pulp and paper industry, which requires enormous quantities of power, is located for the most part in these two provs., and in the newly acquired prov. of Newfoundland (*q.v.*). The leading mineral products are coal, copper, gold, nickel, cement, lead, asbestos, clay products, silver, zinc, stone, natural gas, sand and gravel, lime, petroleum, gypsum, cobalt, salt, and platinum. The metals of chief importance in C. are copper, gold, iron, lead, magnesium, nickel, those of the platinum group, pitchblende products, silver, and zinc. Various gov. agencies, estab. for the purpose, have stimulated production of the chief non-ferrous metals—copper, nickel, lead, and zinc, as well as tungsten, molybdenum, chrome, mercury, mica, arsenic, fluorspar, graphite, and cobalt. Six of these—mercury, tungsten, chrome, molybdenum, muscovite mica, and fluorspar—were not produced in quantity in C. before the Second World War. In order of value gold is the chief mineral (in 1943, 26.5 per cent of the total value of mineral production), nickel (13.5 per cent), copper (12.7 per cent), coal (11.9 per cent), zinc (4.6 per cent), asbestos (4.4 per cent). These ratios were more or less maintained in the mining returns for 1945 and 1946.

The coal seams of Cape Breton were the first to be worked in N. America. Metallurgy began on the St. Maurice R. when in 1740 a furnace for smelting the local bog iron ore was estab. Among famous finds of minerals which have made mining hist. were those of a deposit of argentiferous galena in Lake Temiskaming and the famous gold rushes to the Fraser R. and Cariboo in the fifties, which led to the founding of the colony of Brit. Columbia; and the accidental discovery, during the blasting of a cutting for the Canadian Pacific Railway in 1883, of a body of nickel-copper ore near Sudbury, which has since made that dist. world-famous; the Klondyke gold rush of 1898; the finding of silver in the Cobalt dist. in 1903 during the construction of the N. Ontario Railway; the gold finds at Porcupine and Kirkland Lake early in the twentieth century, the subsequent copper-gold discoveries in W. Quebec, and the recent discovery of uranium ore near Flin Flon, Manitoba. Whilst traces of many minerals are known to exist in Newfoundland their inaccessibility and, in most cases, the considerable capital expenditure required to exploit them have prevented the development of any large-scale operations except in the case of the iron ore deposits on Bell Is. and the composite lead-zinc-copper deposits at Buchans in the centre of the is. Large high-grade iron ore deposits exist in Labrador and intensive work is being carried out in the areas concerned. There are also a number of smaller operations concerned with the working of fluorspar, limestone, and pyrophyllite, whilst some prospecting and exploration are in progress where deposits of gold and asbestos are known to exist. There are also known to be coal seams on the W. coast; but it is not yet possible to indicate what effect all these mining developments in Newfoundland may ultimately have on the economy of the prov. The number of men employed in the Newfoundland mining industry in 1945, was 2571 (Bell Is. mines, 1427); the total value of the mineral exports of Newfoundland in 1944–45 was \$7,021,075. The mining industry of C. employs over 90,000 persons in the operations of mines, mills and smelters, quarries, gas and oil wells, and investment in mine plant and equipment and in working capital amounts to nearly \$1,055,000,000 (\$800,000,000 in metalliferous and \$255,000,000 in fuels). The total estimated value of C.'s mineral production (1943) was over \$530,000,000. In 1945 the total figure was \$179,588,000.

Agriculture.—Farming is still the leading primary industry in C. though the rapid advance of secondary industries has placed C. among the important manufacturing nations of the world. The parent of Canadian agriculture may be said to be Louis Hébert, the first real Canadian farmer, a Frenchman who landed in 1617 and began to clear land at a spot now in the centre of Upper Town, Quebec. In half a century from that time the *habitants* had 11,000 ac. under crop and 3000 cattle. Wheat, as in

U.S.A., is the premier crop, and it is in respect of the prin. grain crops, but especially of wheat, that agric. progress in C. has been so remarkable. For ten years after confederation the wheat crop rarely exceeded 25,000,000 bushels, but in 1898 the yield was over 50,000,000 bushels and exports reached 24,500,000. The completion, in 1886, of the Canadian Pacific Railway linked E. and W., made the dominion for the first time an economic unit, and opened up the great prairie lands of the middle W., with their soils of virginal fertility. The prairie provs. have since gradually come to produce nearly all

in 1943, 195,000,000 in 1944. Grain production yields (in bushels) in the post-war years (including 1945) were: wheat 1945, 318,512,000, 1946, 413,725,000; 1947, 340,758,000; and 1948, 391,000,000; oats, 1945, 381,596,000, 1946, 371,069,000, 1947, 278,670,000 and 1948, 361,700,000; barley, 1945, 157,757,000, 1946, 148,887,000; 1947, 141,372,000, and 1948, 157,100,000 (figures for 1948 are estimates). Prices of agric. products reached their peak during and just after the First World War. They slumped steeply thereafter, falling to a very low level in 1923, recovering, however, considerably



National Film Board, Canada

HARVEST IN ALBERTA: A COMBINE IN A TYPICAL STRIP-FARMING FIELD

the wheat of the dominion. The first year in which production exceeded 100,000,000 bushels was 1905. In 1915 it was 393,000,000 bushels, and in six of the seven years, 1922-28, was this total exceeded. In 1928 the yield was actually 566,000,000, but in 1929, owing to a severe drought, it fell sharply to 304,000,000. Production in the years following was, 1930, 420,500,000; 1931, 321,330,000; 1932, 443,000,000, 1933, 282,000,000; 1934, 276,000,000; 1935, 282,000,000; 1936, 219,200,400; 1937, 182,400,000; and 1938, 348,000,000. In the Second World War the totals were 1941, 315,000,000; 1942, 556,000,000; 1943, 284,000,000; 1944, 436,000,000. The other grain crops are of scarcely less importance for the maintenance of the livestock industry: oats yielded 564,000,000 bushels in 1923, 500,000,000 in 1944. Barley yielded 259,000,000 bushels in 1942, 216,000,000

in later years. As the effects of the First World War came to be felt, the maximum was reached in 1919 with a total of \$1,537,179,100. This value receded in 1923; but the recovery during recent years, combined with excellent harvests, brought the value up to about \$1,173,133,600 in 1927 and \$1,125,000,000 in 1928. From then it declined to \$948,981,000 in 1929, and \$432,199,000 in 1931. From then (excepting in 1935) there was a rise in value until in 1936 it stood at the highest level since 1930. In 1937 it was \$553,823,000. In the Second World War years values rose sharply: 1939, 686,000,000; 1940, 677,000,000; 1941, 684,000,000; 1942, 1,179,000,000; 1943, 1,184,000,000; and 1944, 1,288,000,000. In 1945 the total prices of agricultural products were \$1,284,682,000; in 1946, \$1,245,254,000 (estimated).

Apart, too, from expansion of area and increase of vol., the production of better varieties of grain and improvement in the methods of cultivation under the scientific and educational activities of the dominion and prov. depts. of agriculture have also been of great importance. In 1948 the Federal Dept. of Agriculture operated 28 experimental farms and stations, 7 large substations, 52 smaller substations, and 159 illustration stations. To ensure full co-operation between the dominion dept. of Agriculture, the prov. depts., the agric. colleges, and the farmer, an advisory council on agric. service, consisting of dominion and prov. representatives meets annually. Wheat of the prairie provs. is famous for its hard, dry, glutinous quality. Apart from the effects of climate and soil, its success has been largely due to the excellence of the Red Fife variety, which was discovered accidentally in 1842 by an Ontario farmer named David Fife. The success of the celebrated Marquis variety of wheat has been such that by 1930 it had almost entirely superseded the Red Fife. The use of this new variety has increased by millions of dollars annually the revenue derived from wheat-growing by the farmers of W. C. Still later products are varieties called Garnet and Reward.

Important developments have occurred in W. C. during recent years by the organisation of what are popularly known as wheat pools, which represent a form of co-operative marketing by producers. The grain producers of the prairie provs. had previously co-operated in the ownership and working of grain elevators. The formation of the wheat pools is a further development of the same principle. The inspiration of the enterprise was supplied by the success of the gov. control of grain marketing during the war, which control ceased in 1920. In 1921 representatives of each of the three voluntary W. wheat pools of Alberta, Saskatchewan, and Manitoba organised a central selling agency under a dominion charter, with the title of the Canadian Co-operative Wheat Producers, Ltd. The claim made for the pools is that better prices are obtained for the members than by the ordinary system of marketing, and, by 1930, the pools were operating over 1600 country elevators and and eleven terminals at Vancouver, Fort William, Port Arthur, and Buffalo. In the early months of the Second World War, the total licensed capacity of grain elevators in C. was approximately 423,000,000 bushels; in 1915, the total had risen to 596,000,000 bushels or 40 per cent over the storage capacity before the war. The total daily capacity of flour mills is nearly 100,000 barrels. There were (1942) 1171 flour and feed mills operating in C. and the output of the flour-milling industry (in 1942) was valued at \$31,417,000 (net) or \$159,464,000 (gross). In addition to the ordinary crops grown on a field scale, there are a number of special crops suited to particular localities which represent an important proportion of C.'s agric. wealth. These comprise tobacco, maple syrup and sugar.

sugar beets for beet sugar, flax for fibre, and others. The raising of livestock has made substantial progress in the dominion. The removal of the embargo against the introduction of store cattle into Great Britain was secured in 1923 and as a result shipments of store cattle to Great Britain reached the total of nearly 120,000 in 1926 against the previous year's 30,000. In the war years 1910-43 the numbers exported were 234,000, 254,000, 216,000, and 63,000 respectively, and practically all went to the U.S.A. About 3,500,000 sheep are produced annually. There are about 3,000,000 horses in C. Cattle in the two decades 1921-41 totalled between 8,000,000 and 8,500,000; swine numbered 1,774,000 in 1931 and 6,174,000 in 1941. Totals in 1946 were: Sheep, 3,378,000; horses, 2,387,000; cattle, 7,792,000; swine, 89,850,000. Large numbers of poultry and rabbits are also produced. The establishment of the dairying industry on a co-operative basis has been one of the most striking of Canadian agric. developments. Co-operative farming is indeed regarded as the sheet anchor of present-day farming in E. C. In 1944 the income from dairying amounted to \$264,000,000 as compared with \$148,000,000 at the commencement of the Second World War. The total value of all products of dairy factories in 1945 was \$260,000,000. Slaughtering and meat packing are important side industries. The fruit-growing industry of C., owing to the congenial climate and soil of the Annapolis valley, the Niagara peninsula, and the Okanagan dist., Brit. Columbia, has become world known. In Brit. Columbia commercial fruit growing is of comparatively recent origin, but progress has been very rapid in recent years and in fruit farming the prov. now leads all the other provs., the value of its production being (1946) more than that of the next prov. (Ontario) and over fivefold that of Nova Scotia. The total value of Canadian commercial fruit in the five years between 1936 and 1940 varied between \$15,619,000 in 1936 to \$19,993,000 in 1938; in the three years 1941-43 the values were \$20,537,000, \$27,656,000, and \$30,835,000 respectively. In the five-year period 1935-39 apples were valued at nearly \$11,000,000; strawberries at \$2,104,000; peaches at \$1,473,000; raspberries, \$953,000; and grapes at \$793,000. Other fruits included pears, \$701,000; plums and prunes, \$318,000; apricots, \$104,000; cherries, \$556,000; loganberries \$100,000. During the Second World War years there were large increases in production: apples (1942), 13,000,000 bushels, value over \$14,000,000; peaches (1942), 2,000,000 bushels, value \$3,550,000; strawberries (1940), 23,000,000 bushels, value over \$2,000,000; plums and prunes (1941), 536,000 bushels, valued at \$822,000; pears (1942), 753,000 bushels, valued at \$1,429,000; raspberries (1940), 12,000,000 bushels, valued at \$1,214,000; grapes (1942), 74,913,000 bushels, valued at \$1,862,000; cherries (1942), 364,000 bushels, valued at \$1,587,000; and loganberries (1940), 1,886,000 bushels, valued

at \$100,000. Of the 2,242,000 barrels of apples exported in an average year before the war, all but 100,000 barrels went to the United Kingdom.

Forestry and Lumbering.—The timber industry of C. has always been of the greatest importance, and since the invention of so many uses for wood pulp it has gained rather than lost. The Canadian saw-mills are very well managed and appointed, and large numbers of men are employed in the various stages of the timber industry. The varieties of woods dealt with include the maple, elm, hickory, ironwood, spruce, cedar, pine,

252,000,000,000 board ft., of logs in trees large enough to produce sawlogs and 1,685,000,000 cords of smaller material suitable for pulpwood, fuel, posts, mining timber, etc. To the above forestry resources must now be added those of Newfoundland, and the area under timber in that prov. has been estimated at 25,000 sq. m. Of these 4900 sq. m. remain under the control of the Crown, mostly in the form of a strip around the coastline known as the 'three-mile limit,' much of which has now been denuded by excessive cutting, both for local and other needs. Of the balance,



VANCOUVER ISLAND: A LOGGING TRAIN

Paul Popper

hemlock, walnut, oak, basswood, chestnut, rowan, birch, willow, etc. The forest area of C. has recently been estimated at 1,220,400 sq. m., or 35 per cent. of the total land area. About 450,000 sq. m. of the existing forests are classed as 'unproductive,' but these unproductive trees help to protect the watersheds and conserve water supplies, besides providing fuel and building materials to natives and travellers in remote areas. The productive forests covering more than 770,000 sq. m. are considered capable of producing continuous crops of timber suitable for domestic and industrial purposes. A considerable proportion of these forests is not yet accessible to commercial operations, but constitutes a valuable reserve for the future. The total stand of timber of merchantable size is estimated to be 389,000,000,000 cub. ft., of which 239,000,000,000 cub. ft. is accessible. Expressed in commercial terms, the accessible timber is made up of

small timber companies control a little over 2000 sq. m.; whilst the two major pulp and paper concerns, the Anglo-Newfoundland Development Company, of Grand Falls, and Bowater's of Corner Brook, hold between them 19,000 sq. m. or four-fifths of the total forest area of the is. Of the 25,000 sq. m. hitherto regarded as forest, only 15,000 sq. m. are suitable for commercial exploitation and of these the two large companies hold 11,000 sq. m. between them. In terms of production and employment, the pulp and paper industry ranks immediately after the fisheries in importance in Newfoundland.

Commerce.—From an isolated and dependant community, C. has become a nation trading with most countries of the world, and now exceeds many of the oldest and largest countries in commercial status. Her total trade in the decade 1929-39 ranged from \$2,476,000,000 (1929) to under \$1,000,000,000 during the

economic crisis of 1932-33. By 1937 it had reached a figure twenty-fold what it was at confederation. In only four of the twenty-six years, 1919-44, have imports exceeded exports, and in two of these years, viz. 1920 and 1931, the amounts of the excess were quite moderate. On the other hand, what is generally referred to as the 'favourable balance of trade' has been, on the average, quite substantial, indeed embarrassingly so for the three war years, 1912-44, owing to the export of the vast quantities of munitions of war that the Canadian economy was geared to produce. In the early years of the dominion, when the United Kingdom was lending C. capital on a considerable scale, that country supplied more than half of the Canadian imports, even though, as a purchaser of Canadian goods, she took second place to the U.S.A. To-day, though there have been vast changes and shifting trends, Canadian trade is still carried on predominantly with these two countries. In 1941 C.'s export trade amounted to \$3,483,098,000; this was twice as large as during any year of the First World War, and three and a half times greater than in 1939. Exports alone during 1944 were much higher than total external trade in 1939. Marked changes characterised the trade of C. during the war year and indeed after the war. Prior to the First World War a large proportion of Canadian exports were raw or only semi-manuf. goods, whereas to-day the larger bulk of exports are fully manuf. In 1941 36 per cent of all exports went to the United Kingdom and 11 per cent to other countries of the Brit. Commonwealth; 38 per cent to the U.S.A., and 15 per cent to other countries. C. is in normal periods the leading nation in the exportation of wheat, printing paper, nickel, and asbestos; occupies a place near the top for wheat flour and wood pulp, and a high place for lumber and timber, automobiles, copper, barley, fish,

cheese, furs, whisky, farm implements, cattle, gold, silver, leather, and hides, meats, oats, rye, and rubber footwear. The trade of C. for many years has been carried on with the United Kingdom and the U.S.A., with whose standards of living and tastes Canadians have much in common; but from Confederation to the outbreak of the Second World War there were marked fluctuations in the position of the two countries in regard to their trade with C. Coming, however, to recent years, from 1929 to 1938, C. sold the Brit. people about \$2,800,000,000 worth of goods, and bought less than half that amount from the United Kingdom. In each of the seven years prior to 1939 the United Kingdom was the greatest single buyer of Canadian exports. Previous to the Second World War C. had in the United Kingdom a customer who was able to buy from her without regard to the amount of trade in the opposite direction, and who was able to pay in cash of a kind that could be readily converted and used anywhere. But during and after the war Brit. exports fell to a very low level, and there was a heavy decline in the return from Brit. investments abroad, factors which must affect the future trade policy of the United Kingdom in relation to the purchase of Canadian products. In 1940 the United Kingdom regained the position as the chief market for Canadian exports which she had held since 1932 (with the exception of 1939); this position was kept in 1941, but in 1942 and 1943 the U.S.A. became C.'s best customer. C.'s total trade with the United Kingdom in 1937-1938 was \$554,400,000, having increased threefold since 1900, with the U.S.A. it was \$910,438,000, a seven-fold increase in forty years. Canadian trade (excluding gold) with the Brit. Empire and foreign countries for the years 1939-43 was as shown in Table 1 (the figures are in thousands of dollars):

CANADIAN TRADE WITH:

Item and Year	United Kingdom	United States	Other British Empire	Other Foreign Countries	Total British Empire	Total Foreign Countries
Imports						
1939	114,007	496,898	74,893	65,257	188,900	562,155
1940	161,216	714,231	106,167	70,336	267,383	814,568
1941	214,419	1,004,198	140,523	84,351	359,942	1,088,850
1942	161,113	1,301,680	112,664	65,786	273,777	1,370,465
1943	134,965	1,423,672	103,666	72,773	238,631	1,496,446
Exports						
1939	328,099	380,392	102,707	113,728	430,807	494,120
1940	508,096	442,984	147,861	80,013	655,957	522,997
1941	658,228	599,713	220,413	142,619	878,641	742,362
1942	741,717	885,523	412,100	324,433	1,153,817	1,209,957
1943	1,032,647	1,149,232	369,015	420,581	1,401,662	1,569,814

C.'s industrial development is striking, and well illustrated by the character of its exports and imports. In the 1890s C.'s imports consisted chiefly of manufactured products and the exports of raw and semi-

manufactured products; but during the twentieth century the position has been reversed, imports comprising raw and semi-manufactured goods for use in her manufs., and exports comprising primary

products which have undergone some process of manuf. Imports for use in industry include alumina and cryolite; bituminous coal; raw cocoa; raw cotton; crude cotton-seed oil; raw furs; raw hides; iron ore; unmanufactured leather; oxide of manganese; manilla and sisal grass; oils for soap; crude petroleum; raw rubber; raw silk; skelp iron for pipe;

sugar for refining; sulphur; tin in blocks, tin plate; raw tobacco; wire rods for wire; raw wool. Wheat is the most valuable export—though occasionally automobiles have headed the list. The value in order of importance of the leading exports (in thousands of dollars) in the years 1920, 1930, 1910, 1941, 1942, and 1943, was as shown in Table 2:

Commodity	1920	1930	1940	1941	1942	1943
Automobiles	14,884	18,799	54,306	128,760	194,312	210,800
Wheat	185,046	185,787	119,530	161,856	121,818	234,458
Automobile parts	3,097	1,588	10,290	20,239	62,961	213,943
Newsprint	53,640	133,371	151,360	154,357	141,066	144,707
Meats	96,161	7,569	63,289	84,178	110,429	130,790
Aluminium in bars, etc.	5,681	7,729	32,971	75,798	112,154	124,461
Wood-pulp	41,383	39,060	60,931	85,898	95,267	100,012
Planks and boards	75,216	36,743	67,737	74,205	80,115	74,182
Nickel	9,039	20,505	61,163	67,600	68,407	68,346
Wheat flour	91,263	37,540	26,352	44,807	45,814	66,274
Fish	40,687	30,098	29,843	39,512	47,929	56,902
Oats	9,349	1,061	6,177	3,295	6,833	42,294
Electrical apparatus	424	2,291	3,283	4,476	24,996*	41,100
Barley	20,207	987	1,117	1,959	5,140	32,435
Cheese	36,337	13,297	15,723	13,555	26,904	26,811
Furs, raw	20,628	15,202	15,617	15,448	17,382	25,584

* Chiefly radio and wireless apparatus.

The figures for 1944 were comparable with those of the other war years, but those for 1945 and 1946 seem to indicate considerable changes in the relative positions of some of the leading exports (see Table 3):

	1945 thousands of dollars	1946 thousands of dollars
Wheat	475,787	250,000
Automobiles	206,795	78,000*
Newsprint	179,451	266,000
Meats	166,974†	120,000†
Aluminium in bars, etc.	121,779	56,000
Wood-pulp	97,855	114,000
Planks and Boards	98,936	125,000
Wheat flour	97,855	127,000
Automobile parts	93,852‡	—
Fish	80,226	87,000
Electrical apparatus (chiefly radio and wireless)	60,957	21,000
Nickel	54,778	55,000
Oats	47,680	—
Eggs (dried and in the shell for war years)	44,120	27,000
Copper in forms	34,055	37,000
Rubber and products	31,328	—
Fertilizers	30,428	32,000
Furs	29,572	31,000
Cheese	27,909	22,000
Barley	24,101	—
Pulpwood	23,881	29,000
Whisky	22,977	30,000
Asbestos, raw	21,842	25,000
Locomotives and parts	21,473	53,000§
Zinc	20,373	28,000
Farm implements, etc.	20,196	29,000

* Includes trucks and parts.

† Includes bacon and ham, fresh beef, and veal and canned meats.

‡ Figures included in those for automobiles.

§ Including railway cars.

Since Confederation, exports have exceeded imports in thirty-seven years, while imports have exceeded exports in thirty-six years. The 'unfavourable' trade balances occurred chiefly in 1903-13, years of heavy capital imports. Since Confederation there has been an excess of exports to the United Kingdom in sixty years, and an excess of imports in twelve years. During the past seven decades the trade balance with the U.S.A. has been unfavourable in over sixty years, favourable only in nine years, favourable balances being recorded in 1934-35, 1935-36, and 1936-37. The exchange of commodities does not, however, complete the tale of Canadian commercial prosperity, for many 'invisible' exchanges must be taken into account, interest and freight payments, insurance premiums, and financial services, while the money spent by tourists constitutes an appreciable income for which C. has to thank her picturesque scenery, fish and game preserves, and winter sports.

Since 1879 the foreign commerce of the dominion has been affected to a large extent by the increase of the customs tariff. The percentage of duty on the total value of goods imported, both dutiable and free from duty, was in 1868 12 per cent, and in 1878 13½ per cent. In the following year a general increase in the tariff was sanctioned by the gov., and what is known as the 'national policy' was begun. The percentage of duty was in 1881 20½ per cent, and in 1901 16 per cent. There are no restrictions placed on trade between the different prov., and within the boundaries of the dominion free trade prevails. The Colonial Conference of 1894, held at Ottawa, carried a resolution in favour of an arrangement between Great Britain and her colonies

by means of which the former should be given preferential treatment over foreigners. Accordingly an Act was passed in 1897 under which Brit. goods were to be admitted on the payment of customs dues 25 per cent less than those levied on foreign goods; the new arrangement came into force from Aug. 1, 1898. The preferential reduction was raised to 33 1/3 per cent from July 1, 1900.

Two trade agreements, one between C. and the U.S.A., and the other between the United Kingdom and the U.S.A., were signed at Washington, on Nov. 17, 1938. They mark a step forward in the estab. of better trade relations between the Brit. Commonwealth and the U.S.A.; their significance lies in the fact that they are the most notable advance yet achieved in the new trade-agreements programme, which is the U.S.A.'s Gov.'s contribution to the lowering of the barriers to international commerce. The agreements were the result of protracted negotiations in which all the self-governing dominions were called upon to concur in the temporary modification of certain preferential privileges they had long enjoyed in the Brit. market in order to contribute to the freer flow of trade between the Eng.-speaking peoples—the world's greatest empire and its greatest republic. The extension to all countries with which the parties to these treaties are on a most-favoured-nation basis is implied in the agreements. For the rest, tariffs as between C. and the United Kingdom depend on the Ottawa Agreements (*q.v.*) of 1932.

Manufactures.—The present century witnessed the chief upward movement in Canadian manufs., the result of two major influences, first, the 'boom' accompanying the opening up of the 'last best West,' which greatly increased the demand for manufactured goods of all kinds, but especially construction materials, and secondly, the First World War, which created huge new demands and left a permanent imprint on the variety and efficiency of Canadian plants. Just before the Second World War C. had (*e.g.* in a typical year like 1936) 21,202 manufacturing estabs., whose capital investment in lands, buildings, and equipment amounted to over \$3,271,000,000, and which employed 501,360 persons. Before the war the leading industries were: pulp and paper; flour and grist-mill products; slaughtering and meat-packing; central electric stations; sawmills; automobiles; butter and cheese; rubber goods, including footwear; electrical apparatus and supplies; non-ferrous metal smelting; cotton yarn and cloth; railway rolling-stock; castings and forgings; bread and other bakery products; petroleum; printing and publishing; sugar refineries; clothing; cigars and cigarettes, hosiery; biscuits; confectionery and chewing gum; breweries; planing mills; boots and shoes; and rolled products, pig-iron, steel products, etc. In 1942 the incidence of the Second World War resulted in a rearrangement in the rank of many industries. Industries producing supplies and equipment for the armed forces

naturally advanced while those industries producing for the domestic consumer market declined in importance. To supply the raw materials needed by the industries engaged principally in war production, it became necessary to restrict or prohibit the manuf. of many products such as pleasure cars, radios, washing machines, electrical equipment, household appliances, agric. implements, etc. Though these industries were forced to change over to wartime production, the changes did not affect the value of their output, and consequently their importance as producers of manufactured goods did not alter drastically. In 1942 the number of estabs. was 27,862, the number of employees 1,152,091, and the capital employed \$5,488,000,000. But to analyse the effects on the war on any industry, it is necessary to compare the nature of the products made before the war with that of the wartime years. Measured by gross value of products the most important manufacturing industries in 1942 appeared to be as follows: producers' materials (*i.e.* farm, manufacturing, building, and general materials), \$2,177,577,100; industrial equipment (*i.e.* farming, manufacturing, trading, service, light, heat, power, and general equipment), \$1,315,623,021; food, \$1,287,339,635; clothing, \$497,675,551; drink and tobacco, 236,292,352; books and stationery, \$190,289,162; house furnishings, \$171,793,189; personal utilities, \$98,406,172; and other commodities, \$275,235,214. (See also under *History* for wartime industrial developments.) In 1946 the total number of estabs. was 29,050 and, in terms of gross value of output, the chief manufs. were: iron and iron products, \$1,975,310,000; vegetable products, \$1,353,000; wood and paper products, \$1,184,651,000; textiles and textile products, \$807,722,000; non-ferrous metal products, \$779,385,000; chemicals and allied products, \$478,533,000; non-metallic mineral products, \$405,736,000, and other commodities, \$154,116,000. Exports of manufactured products increased from less than \$3,000,000 per annum on the average of 1871-75 to \$614,000,000 in the post-war fiscal year ended March 1920. Exports of 'fully manufactured' products in the fiscal year ended March 1937, amounted in value to \$384,234,219 and exports of 'partly manufactured' products to \$296,421,415. In 1943 the 'fully or chiefly manufactured' export figure was \$1,954,865,077; 'partly manufactured,' \$497,712,310 (raw materials being \$518,897,881). In the post-war years (including 1945) exports of partially manufactured products were: 1945, \$535,931,000; 1946, \$511,751,026; and 1947, \$721,767,318. Exports of fully or chiefly manufactured products were: 1945, \$1,821,085,000; 1946, \$1,196,995,216; and 1947, \$1,408,583,830. The leading centres of manuf. are Toronto and Montreal, the next, Hamilton, Winnipeg, Vancouver, Oshawa, and Ottawa, more or less in that order of value.

Population and Area.—The four original provs. of C. contained 350,188 sq. m. of land and inland waters, of which the

original land area was 338,224 sq. m. After purchase of the Hudson Bay Ter. in 1870 and the admission of Brit. Columbia in 1871 and of Prince Edward Is. in 1873, the area of the dominion was 3,470,392 sq. m. Further exploration in the N. regions resulted in increasing this area to 3,797,123 sq. m. as estimated in 1926, but the decision of the Judicial committee of the Privy Council in 1927 in the Labrador boundary dispute reduced this to 3,684,723 sq. m.—which, however, was still more than ten times that of the original confederation. The present area (including Newfoundland which entered the confederation in 1949) is shown in the tables opposite.

The pop. is distributed in the main only along the S. border. The prin. nationalities represented are Eng., Fr., Irish, Scotch, Gers., Jews, and Russians, and though there are also some few Dutch, Chinese, Welsh, Its., Icelanders, S. Europeans, Swedes, Swiss, Indians, Poles, Norwegians, half-breeds, etc. Eng. is the general language of C., though in some parts of Quebec Fr. is the only language understood, and the Fr. language is by statute an official language in the dominion Parliament and in Quebec, but not now in any other prov. Members of the Quebec and Manitoba Parliaments may also address the House in either Eng. or Fr. The number of Indians in C. in the year 1881 was estimated to be 108,547. In 1941 the number was 118,316 (Ontario, 30,336; Brit. Columbia, 24,375; Manitoba, 15,473; Saskatchewan, 13,384; Alberta, 12,565; Quebec, 11,863). It is thus seen that the race is practically stationary, and when it is recalled that very few Indians of pure blood remain, it may be said to be gradually declining. Such as are in inhabited dists. are usually located on reserves, and are engaged in agric. and industrial pursuits. Many of them hunt and fish for their livelihood, and many are employed as guides by sportsmen.

From 1869 to 1873 there was general prosperity in C., reflecting the construction of the Suez Canal, the industrial development of Germany, and the world-wide railway boom. C. in that period found many new markets. There followed a period of depression, again through external influences, mitigated, however, by the completion of the Canadian Pacific Railway. In 1870 manufs. were stimulated by the adoption of a protective tariff, though, generally speaking, conditions continued depressed until the early nineties, and it was not until almost the end of the nineteenth century that conditions were marked by buoyancy. The censuses of 1881, 1891, and 1901 reflect these conditions. That of 1881 showed a gain of 635,000, but the gains in the two next decades were each under 550,000. It is within the present century that the spectacular expansion of the Canadian pop. and general economic body has taken place. The dominant initial feature was the opening of the 'last best West.' W. pop. had doubled in each of the decades following the completion of the Canadian Pacific Railway; but after 1904

the movement became greatly accelerated. Capital in huge amounts came from Great Britain to undeveloped countries throughout the world, and especially to Canada. Further, immigration, which had seldom previously exceeded 450,000 a year, rose to over fivefold, totalling in the years 1903-13 over 2,500,000, as many as in all the previous years back to Confederation. After the setting-in of the world economic depression in 1930 immigration practically ceased. The following are the totals of immigrants in the years 1891-1944: 1891, 82,000; 1892, 31,000; 1893, 30,000; 1894, 21,000; 1895, 19,000; 1896, 17,000; 1897, 22,000; 1898, 32,000; 1899, 45,000; 1900, 42,000; 1901, 56,000; 1902, 89,000; 1903, 139,000; 1904, 131,000; 1905, 141,000; 1906, 212,000; 1907, 272,000; 1908, 143,000; 1909, 174,000; 1910, 287,000; 1911, 331,000; 1912, 376,000; 1913, 401,000; 1914, 150,000; 1915, 37,000; 1916, 56,000; 1917, 73,000; 1918, 42,000; 1919, 108,000; 1920, 139,000; 1921, 92,000; 1922, 64,000; 1923, 134,000; 1924, 124,900; 1925, 85,000; 1926, 136,000; 1927, 159,000; 1928, 167,000; 1929, 165,000; 1930, 105,000; 1931, 28,000; 1932, 21,000; 1933, 14,000; 1934, 12,000; 1935, 11,000; 1936, 12,000; 1937, 15,000; 1938, 17,000; 1939, 17,000; 1940, 11,000; 1941, 9,000; 1942, 8,000; 1943, 9,000; 1944, 13,000. Immigration figures for the post-war (fiscal) years (including 1915) were: 1945, 31,081; 1946, 66,990; and 1947, 64,127. On the effects of the world economic depression of the 1930's on C., see under *History* below.

Religion and Education.—There is no state religion in C., and absolute toleration is an accomplished fact. Over the period from 1871 to 1941 something like 40 per cent of the pop. of C. has been of the Rom. Catholic faith, and this proportion has been remarkably constant over the seventy years. The 1941 percentage (inclusive of Gk. Catholics) was 43.34 per cent. Methodists were 15.67 per cent in 1871 but fell to 13.19 per cent in 1921. Presbyterians increased from 15.57 per cent in 1871 to 16.04 per cent in 1921; they were reinforced by the considerable immigration from Scotland after the beginning of the century. The organisation of the United Church of C. in 1925 left the Presbyterians and the Congregationalists much weaker in membership. Almost all Methodists, the main body of Congregationalists, and a large number of Presbyterians united to form that Church. In 1941 the leading religious denominations were as follows: Rom. Catholic, 4,986,552 (including 185,657 Gk. Catholics); United Church (see immediately below), 2,204,375; Anglican, 1,751,148; Presbyterian, 829,147 (the figures entered opposite Presbyterian and Congregationalist in the census returns represent the number not included in the United Church); Baptist, 483,592; Lutheran, 401,153; Jewish, 168,367; Gk. Orthodox, 139,629; Mennonite, 111,380. Of the total pop. of the new prov. of Newfoundland and Labrador (1945), 100,872 belonged to the Church of England, 105,895 were Rom. Catholics, 79,758

LAND AND WATER AREA OF CANADA BY PROVINCES AND TERRITORIES

<i>Provs. and Ters.</i>	<i>Land</i>	<i>Fresh Water</i>	<i>Total</i>
	sq. m.	sq. m.	sq. m.
Prince Edward Is.	2,184	—	2,184
Nova Scotia	20,743	325	21,068
New Brunswick	27,473	512	27,985
Quebec	523,860	71,000	594,860
Ontario	363,282	49,300	412,582
Manitoba	219,723	26,789	246,512
Saskatchewan	237,975	13,725	251,700
Alberta	248,800	6,185	255,285
Brit. Columbia	359,279	6,976	366,255
Yukon	205,346	1,730	207,076
N.W. Ters.: Franklin	516,532	7,500	554,032
Keewatin	218,460	9,700	228,160
Mackenzie	493,225	31,265	527,490
Newfoundland	42,734	—	42,734
	3,509,616	228,307	3,737,923

GROWTH OF POPULATION IN CANADA

<i>Prov. or Ter.</i>	1871	1881	1891	1901
Prince Edward Is.	94,021	108,891	109,078	103,259
Nova Scotia	387,800	410,572	450,336	459,574
New Brunswick	285,594	321,233	321,263	331,129
Quebec	1,191,516	1,359,027	1,488,535	1,648,898
Ontario	1,620,851	1,926,922	2,114,321	2,182,917
Manitoba	25,228	62,260	152,506	255,211
Saskatchewan	—	—	—	91,279
Alberta	—	—	—	73,022
Brit. Columbia	36,217	49,459	98,173	178,657
Yukon	—	—	—	27,219
N.W. Ters.†	48,000	56,416	98,967	20,129
Total	3,689,257	4,324,810	4,833,239	5,371,315

<i>Prov. or Ter.</i>	1911	1921	1931	1941
Prince Edward Is.	93,728	88,615	88,038	95,047
Nova Scotia	492,338	523,837	512,846	577,962
New Brunswick	351,889	387,876	408,219	457,401
Quebec	2,005,776	2,360,510*	2,874,662	3,331,882
Ontario	2,527,292	2,933,662	3,431,683	3,787,655
Manitoba	461,391	610,118	700,139	729,744
Saskatchewan	492,432	757,510	921,785	895,992
Alberta	374,295	588,451	731,605	796,169
Brit. Columbia	392,480	524,582	694,263	817,861
Yukon	8,512	4,157	4,230	4,914
N.W. Ters.†	6,507	8,143	9,316	12,028
Total	7,206,643	8,787,949	10,376,786	11,506,655

The estimated pop. of Newfoundland (exclusive of Labrador) at Dec. 31, 1915 was 312,899; (including Labrador), 318,177.

* Revised in accordance with the Labrador award of the Privy Council, March 1, 1927.

† The decreases shown in the pop. of the N.W. Ters. since 1891 are due to the separation therefrom of vast areas to form Alberta, Saskatchewan, and Yukon, and to extend the boundaries of Quebec, Ontario, and Manitoba.

United Church, and 1,579 Presbyterians. Taxation to support free and unsectarian schools has been levied in C. since 1846. The control of the system is vested in trustees elected locally, and the expenses are met by local rates and provincial gov. grants. In Ontario and Quebec, where the number of Rom. Catholics is very large, there are separate schools for members of that denomination; there used to be such schools in Manitoba, but there they were abolished in 1890. The teachers are trained in provincial normal schools at the public expense. The standard of education in the dominion is a very high one, and poverty need be no bar to the

of which has a dept. of education. That education is a great feature in the country is to be gathered from the fact that there are no fewer than 2,330,000 pupils and students in educational institutions, though the fact that C.'s pop. has so high a proportion of persons in the younger periods of life compared with other countries, must be borne in mind. The dominion gov. occasionally makes grants in aid of specific forms of education, as under the Agricultural Education Act of 1913, and the Technical Education Act of 1917. Agric. education is not conducted through the medium of boarding schools to the extent that it is in



Canadian Air Board

WINNIPEG: MANITOBA PARLIAMENT BUILDINGS

intellectual student. The chief univs. of C., with the dates of their foundation, are as follows: King's College, Nova Scotia, 1789; Dalhousie, Nova Scotia, 1818; McGill, Montreal, 1821; Acadia, Nova Scotia, 1838; Queen's, 1841; Bishops College, Quebec, 1845; Toronto, 1849 (King's College, 1828); Ottawa, 1849; Laval, Quebec, and Montreal, 1852; New Brunswick, 1859 (King's College, 1828); Mount Allison, New Brunswick, 1861; Manitoba, 1877; W. Univ. and College, London, Ontario, 1878; McMaster, Hamilton, 1887; Alberta, 1906; Saskatchewan, 1908; Brit. Columbia, 1908; Calgary, 1911. Others are, St. Dunstons, Prince Edward Is.; St. Francis Xavier, New Brunswick; St. Joseph's College, New Brunswick; Univ. Victoria, St. Michael's, Trinity, Wycliffe, and Knox Colleges (federated with the univ. of Toronto).

Public education in C. is under the jurisdiction of the provincial govts., each

many other countries. Agric. instruction, of course, receives attention in the ordinary day schools, and for no other occupation, with the possible exception of homemaking, do govts. in C. conduct so many educational services outside the schools as for agriculture. Educational systems in C. have progressed rapidly in the present century, notably in technical and high-school education. Particular mention may be made of compulsory attendance laws and the creation of municipal school dists., rural graded schools, and rural high schools, which are designed to secure larger taxation areas and so support better classes of schools, and the provision of facilities for teaching manual training, domestic science, and vocational work. An indication of progress is to be seen in the decline in the percentage of 'illiterate' which in 1871 was 20 per cent of people over twenty years of age, and in 1921, only 5 per cent. Scientific research

has now made strides. It began in C. in the eighties with the institution in the univs. of courses in experimental and practical science. Research has been promoted by scientific societies such as the Royal Canadian Institute and the Royal Society of C., and by the laboratories maintained by various depts. of the dominion and provincial govts. In recent years, with the growing realisation of the importance of scientific and industrial research, and aided by the growth of Canadian wealth, the scientific equipment of the leading univs. has been greatly increased and the prosecution of research aided by numerous scholarships. An especially notable achievement was the discovery of insulin by Drs. Banting (*q.v.*) and Collip, and Charles Herbert Best, working under Prof. Macleod in the univ. of Toronto. 'The National Research Council,' now operating under the Research Council Act of 1924, has charge of all questions of scientific and technological methods affecting the expansion of Canadian industries or the utilisation of C.'s natural resources.

Currency and Banking.—In 1853 a measure was passed providing for the adoption of decimal currency with a dollar equivalent to the Amer. dollar, and from Jan. 1, 1858, the accounts of the prov. of C. were kept in terms of dollars. The use of the dollar as a monetary unit was extended throughout the dominion by the Uniform Currency Act of 1871. The Canadian dollar is a gold dollar weighing 25.8 grains, nine-tenths fine gold, and thus containing 23.22 grains of gold. Five-dollar and ten-dollar Canadian gold pieces have been coined to a limited extent, but, in the main, the currency of C. is in the form of silver, nickel, and bronze token currency for fractional parts of a dollar and dominion notes and bank notes for multiples of a dollar. Since 1931, the gov. has permitted the export of gold only under licences issued by the dept. of finance, thus conserving C.'s gold resources for meeting external obligations, and Canadian mines now dispose of their gold through the Royal Canadian Mint according to definite conditions of purchase. The Canadian gold reserves, which exist for the redemption of dominion notes, contain, besides Canadian gold coin, Brit. and U.S.A. gold coin, which is also legal tender in C., as well as bullion. The issue of dominion notes in one-dollar, two-dollar, four-dollar, five-dollar, and fractional units, also in larger notes of from fifty to five thousand dollars (and in late years fifty thousand dollars) increased steadily prior to 1914, and very rapidly during the First World War period, after which there was a considerable decline corresponding to the reduction in prices. These notes are legal tender everywhere in C. except at the offices which the gov. maintains for their redemption.

The Canadian banking system is a product of evolution, and its most distinctive feature, the branch bank system, is well adapted to the needs of a country of wide area and scattered pop. Banking in C. began to develop some of the

features of a central bank system soon after Confederation. These in order of date are: Central Note Issue, permanently estab. with the issue of dominion notes under legislation of 1868; the Canadian Bankers' Association, estab. in 1900 to effect greater co-operation in the issue of notes, in credit control, and in various other ways; Central Gold Reserves, estab. in 1913; re-discount facilities, made a permanent feature of the system in 1923, provided the banks with a means of increasing their legal tender cash reserves at will; the Bank of C., estab. in 1935. Legislation was enacted in 1934 to establish the Bank of C. as a 'central' or 'bankers' bank. In 1936 Parliament approved a change in capitalisation which gave a majority of outstanding shares to the minister of finance on behalf of the gov. of C. In 1938 legislation was passed for the purchase of all shares then in the hands of the public by the gov. so that the Bank of C. is now completely owned by the people of C. as a whole. The bank assumed the liability of the dominion notes in circulation in 1935, when the bank commenced business, in return for gold and silver held by the gov. as security for dominion notes and 3 per cent five-year Dominion of Canada bonds. The chartered banks also surrendered to the Bank of C. the gold held by them in C. at the currency value. The bank is empowered to buy and sell securities in the open market; to discount securities and commercial bills; to fix minimum rates at which it will discount; to buy and sell bullion and foreign exchange. It may issue notes to any amount so long as it maintains a reserve of gold coin and bullion equal to not less than 25 per cent of its note and deposit liability in C. The chartered banks are required to maintain a reserve by way of deposit with the bank, and Bank of C. notes of not less than 5 per cent of their deposit liabilities in C. The Bank of C. acts as the fiscal agent of the dominion of C. and may, by agreement, act as banker or fiscal agent for any prov. The bank does not accept deposits from individuals and thus does not compete with the chartered banks in the commercial banking field. The following statement gives the main items of assets and liabilities of the Bank of C. before the Second World War (in 1938). Notes in circulation: \$178,000,000; dominion gov. deposits, \$25,363,000; chartered banks' deposits, \$228,460,000; gold coin and bullion, \$181,146,000; investments, \$214,664,000; total assets and liabilities, \$143,113,000. In 1944 the ann. statement showed the following notes in circulation, \$1,035,972,607; dominion gov. deposits, \$30,996,574; chartered banks' deposits, \$401,723,907; investments, \$1,490,825,869. No figure is given for gold coin and bullion, for the Exchange Fund Order, 1940, authorised the transfer of the bank's gold holdings to the Foreign Exchange Control Board and temporarily suspended the requirement for a minimum gold reserve. In recent years the Canadian banks have extended their business outside the dominion, and now have over

200 branches in other countries, mainly in Newfoundland, the W. Indies, Central and S. America, and in London, Paris, and New York. The grand total of bank debts for C. was \$43,477,000,000 in 1928; \$35,166,000,000 in 1937; \$45,526,000,000 in 1942; \$60,677,000,000 in 1944.

Social Conditions.—The social conditions prevailing in the dominion do not favour the existence of such rigid distinctions of caste as still exist in England. There are few tenants, and consequently few landlords; practically every farmer owns his farm and is his own master. With this pervading sense of freedom, C. has passed many such laws as older nations are still vainly trying to bring forward. There is gov. control of the drink question, with theoretical local options, religious liberty is estab.; free and unsectarian education is practically universal. Divorce was not common in C. before the First World War, but has become more common through the unsettling psychological effect of the war period and the provision of new facilities. In Quebec, as a result of a decision of the Brit. Privy Council, the applicant for divorce must secure a special private Act of Dominion Parliament. In most provs. the public lands are under the control of the local gov. In the prairie provs., the 'Peace River block' and the dominion railway belt of Brit. Columbia, however, the dominion gov. owns land, with the object of obtaining some money to lessen the debt incurred by the acquisition of these ters. and the construction of the Canadian Pacific Railway. In these ters, the gov., before the war, offered facilities for agric. training in part solution of the unemployed youth problem. There were also forestry training projects for young men, and a beginning was made with a plan for training courses in mining. Courses in occupational training, in commerce and industry, are carried on in cities and tns. of sev. provs. for both sexes.

Defence.—The Canadian people have always proved themselves loyal to the empire; they took the field in the war of 1812-14, in Papineau's rebellion of 1837, the Fenian raid, the Red R. expedition of 1870, the N.W. rebellion of 1885, and the second Boer war. The imperial gov. garrisoned the fortresses of Halifax, Esquimault, and Vancouver until the year 1905, when the dominion gov.'s offer to take over the defences of these places was accepted. Prior to 1922, three depts. of the gov. were concerned with defence: the dept. of Militia and Defence; the dept. of Marine and Naval Service; and the Air Board. The National Defence Act, 1922, consolidated them into the dept. of National Defence. The minister of National Defence is advised by a defence council comprising representatives of all the services. C. in 1940 was organised into eleven military dists. The militia was classified as active and reserve, and the active is subdivided into permanent and non-permanent forces. Before the Second World War broke out in Sept. 1939, the permanent force consisted of fourteen regiments and corps of all arms,

with an authorised estab. limited to 10,090, but at that date the strength was about 4000. The non-permanent active militia is made up of cavalry (horse and armoured car), artillery, engineers, signals, infantry, and the usual ancillary corps. The total estab. of the Canadian non-permanent active militia prior to the Second World War was 7050 officers and 79,440 other ranks. All male inhab. of the age of eighteen or more, and under sixty, not exempt by law, and being Brit. subjects, were liable to service in the militia. The Royal Canadian Navy was estab. in 1910. The authorised complements (before 1939) were: 137 officers and 1582 men of the permanent force, and 70 officers and 430 men of the Royal Canadian Naval Reserve. The vessels in commission (in 1939) comprised six destroyers, a training schooner, five minesweepers, and a motor patrol vessel. Naval dockyards are maintained at the naval bases at Halifax and Esquimault. The Royal Canadian Air Force was also classified like the army. It controls and administers all Air Force training and operations. Its strength at the end of 1938 was: permanent officers, 222; non-permanent, 84; reserve, 154; permanent airmen, 1765; non-permanent, 753; number of aircraft, 212. At the outbreak of the Second World War (Sept. 1939) the Canadian Army numbered only about 54,500 men; by October 1944 it had grown to 761,000 men, of whom more than 260,000 were on overseas service. All members of the Canadian Overseas Army were volunteers as also were a large proportion of those on service in Canada and adjacent ters. Under the National Resources Mobilisation Act, men in certain age groups were called up for compulsory military service, but men so called up might at any time volunteer for general service. At the end of 1944, over 390,000 had volunteered for overseas service. At the peak of enrolment of personnel for the navy (Jan. 1, 1945) the numbers were: 8920 officers and 78,821 ratings, while the Women's Royal Canadian Naval Service included 371 officers and 5363 ratings. By that date the Canadian Navy had grown to a force of 939 ships, of which 373 were warships and the remainder auxiliary craft carrying out the various duties of supply and maintenance. (Shortly after VE Day there began the process of decommissioning ships not required for the war against Japan, and by Aug. 1945 almost all the corvettes which had played such an outstanding part in the battle of the Atlantic were out of service.) The total number of R.C.A.F. squadrons overseas as at March 31, 1945, was forty-seven, of which about one-third were heavy bomber units equipped with Lancaster or Halifax aircraft and operating in the R.C.A.F. Group of Bomber Command, R.C.A.F. units operating in Coastal Command from bases in the Brit. Is., Ceylon, and Iceland, included general reconnaissance and fighter reconnaissance squadrons. Day and night fighters and others operated in R.C.A.F. and R.A.F.

wings of the 2nd Tactical Air Force, Allied Expeditionary Air Force, and there was also a fighter squadron in Italy, besides two Canadian transport squadrons in Burma and one in England. The R.C.A.F. administered the famous Brit. Commonwealth air-training plan, under which more than 100,000 air-crew personnel were trained in C. (See AIR FORCE, ROYAL.) The gov.'s plans for Canada's post-war forces show that the navy will have a force of 28,000 officers and men including its reserves; the army will have an active force of 25,000 officers and men with a reserve force numbering 180,000; the air force will number 16,100 of all ranks, with an auxiliary force of 4,500 and a reserve of 10,000 officers and men chosen from those who served in the war. The navy will have an active fleet of cruisers, aircraft carriers, and destroyers with a training and reserve fleet of frigates and Algerine mine-sweepers. All three forces will maintain training centres across the country. In order that C. may be always ready to keep her covenant with the United Nations Organisation, a new estab. has been created, known as Canadian Arsenal Limited. It will be the task of this service to keep the weapons and equipment for all the forces in efficient condition and also to keep gov. and private factories and key civilian personnel in a state of readiness.

Constitution and Government.—The constitution of C. is not an imitation of the constitution of the U.S.A., but is the Brit. constitution federalised. The many unwritten conventions of the Brit. constitution are also recognised in the Canadian constitution; the British North America Act, 1867, which defines the internal constitution of C., contains really a written delimitation of the respective powers of the dominion and provincial govts. Down to the time of the Confederation, C.'s constitutional development is based mainly upon four Acts of the Brit. Parliament, the Quebec Act of 1774, the Constitutional Act of 1791, the Act of Union of 1840, and the British North America Act, 1867. The first of these establishes the Fr. civil law throughout what then constituted the prov. of Quebec; the second divided the country into the Fr.-speaking prov. of Lower C. and the Eng.-speaking prov. of Upper C., and conceded representative gov. through an elective legislative assembly, but without executive control except in so far as it could refuse to vote taxes; the third reunited the two Cs. under a single legislature and conceded the principle of responsible gov.; the executive administration being from that time dependent on the legislature; the fourth separated the two Cs. from their existing legislative union to make them provts., each controlling its own local affairs, in a wider confederation, which within a short period so extended its boundaries as to embrace the whole of Brit. N. America except Newfoundland and Labrador (Newfoundland has since agreed to enter the Canadian Confederation). The constitution of C. cannot be altered save by

the Imperial Parliament, but to all intents and purposes C. has complete autonomy (see further under *History*).

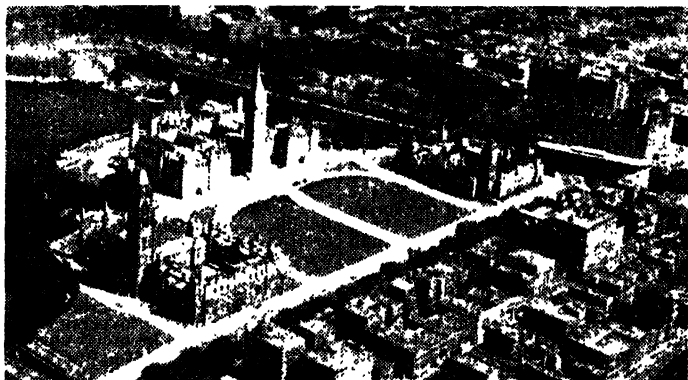
(1) *The Dominion Government.*—The Brit. N. America Act declares that the executive gov. of C. shall continue to be vested in the sovereign of the United Kingdom, represented for dominion purposes by the governor-general, and, for provincial purposes, by the lieutenant-governor. The governor-general is advised by the king's Privy Council for C., a committee of which constitutes the ministry of the day. The dominion Parliament consists of the king, the Senate, and the House of Commons. It must meet at least once a year, so that twelve months do not elapse between the last meeting in one session and the first meeting in the next. Senators, 102 in number, are appointed for life by the governor-general under the great seal of C. The senatorial representation is as follows: Ontario, 24; Quebec, 24; Nova Scotia, 10; New Brunswick, 10; Prince Edward Is., 4; Manitoba, 6; Brit. Columbia, 6; Alberta, 6; Saskatchewan, 6; and Newfoundland, 6. They must be thirty years of age, Brit. subjects, residents of the prov. for which they are appointed, and possess \$4000 over and above their liabilities. Members of the Lower House or House of Commons (who number 252) are elected by the people for the duration of the Parliament, which may not be longer than five years. The prov. of Quebec has the fixed number of 65 members, and the other provs. are represented in the proportion, as ascertained at each decennial census, that the number 65 bears to the pop. of Quebec.

The first dominion Parliament of 1867 consisted at its commencement of 181 members, 82 for Ontario, 65 for Quebec, 19 for Nova Scotia, and 15 for New Brunswick. To this number were added, under the Manitoba Act of 1870, 4 members to represent the then newly created prov. of Manitoba; also, according to the agreement under which Brit. Columbia entered the Confederation, 6 were added to represent that prov., making 191 at the end of the first Parliament of C. In 1874, when Prince Edward Is. entered the Confederation, 6 members were added for that prov. In 1886 4 members were added to represent the N.W. Ters. (2 for Assiniboia and 1 each for the provisional dists. of Alberta and Saskatchewan), the total then being 215. There have since that time been many readjustments, the census of 1911, with its very large but unevenly distributed increase of pop., leading to considerable changes in representation, as enacted by the Representation Act of 1914. The total membership in the thirteenth and fourteenth Parliaments (elected in 1917 and 1921 respectively) was 235. As a result of the smaller increase in pop. shown by the census of 1921, the changes in representation were less far reaching. Nova Scotia lost 2 members and the W. gained 12, 2 of these being added to Manitoba, 5 to Saskatchewan, 4 to Alberta, and 1 to Brit. Columbia.

The representation of the remaining provs. was unchanged. The representation for the newly created prov. of Newfoundland is 7. The nineteenth Parliament, elected on March 26, 1940, comprised 245 members, in accordance with the Representation Act of 1933 which, as the result of the census of 1931, fixed the representation as follows: 32 for Ontario, 65 for Quebec, 12 for Nova Scotia, 10 for New Brunswick, 17 for Manitoba, 16 for Brit. Columbia, 4 for Prince Edward Is., 21 for Saskatchewan, 17 for Alberta, and 1 for Yukon Ter. The only qualification necessary for the Lower House is that the members must be Brit. subjects.

reserved for Indians; naturalisation and aliens; and a number of other lesser topics. In short, it has exclusive legislative power in all matters except those specifically delegated by the constitution to the provincial legislatures.

Since confederation there has been a gradual development of the powers of the Canadian Gov. It was in 1878 that the Hon. Edward Blake secured the formulation of new instructions to the governor-general providing that he should act upon the advice of his ministers. Gradually too, the status of the dominion has become enhanced with each meeting of the Colonial (now Imperial) Conference, and



Canadian In Board

OTTAWA: THE PARLIAMENT BUILDINGS

The dominion franchise is, by the Act of 1922, conferred upon all Brit. subjects, male and female, who have resided in C. for a year, and for two months in the electoral dist. in which they desire to vote, but this latter restriction was removed in 1923 so far as it applied to general elections. The only adult Brit. subjects who are now denied the vote are convicts, paupers in institutions, judges, persons paid for work on behalf of a candidate, and certain persons who by reason of their race are not permitted, under the law of their prov., to vote at a provincial election. The effect of this racial exclusion is, however, to exclude only such Chinese, Jap., and E. Indians as reside in Brit. Columbia and did not serve in the First World War, and such Chinese as reside in Saskatchewan and did not so serve.

The dominion Parliament has exclusive legislative authority in all matters relating to the following: public debt and property; regulating of trade and commerce; taxation; loans on public credit; postal service; census; defence; navigation and shipping; lighthouses; quarantine; fisheries; ferries on frontiers; banking and issue of paper money; Indians, and lands

from 1911 it was recognised that the Brit. Gov. was simply *primus inter pares* among the great nations of the empire. During the First World War, the Canadian premier, together with other dominion premiers, was a member of the Brit. War Cabinet; and, at the close of the war, Sir Robert Borden, then Prime Minister of C., secured for the dominions recognition as signatory powers of the treaty of Versailles and acceptance as members of the League of Nations. (In 1926 a Canadian minister, the Hon. Raoul Dandurand, acted as president of the League assembly.) In 1927 C. was elected as a non-permanent member of the council of the League. Arising out of the recommendations of the Inter-Imperial Relations Committee of the Imperial Conference of 1926, the governor-general of a dominion is now regarded as the personal representative of the Crown and not as an official of the Brit. Gov. Arising out of the position that each dominion is now regarded as a freely associated member of the Brit. Commonwealth of Nations, C. appointed a minister to the U.S.A., which country, in 1927, reciprocated the appointment by sending

a minister to C. Ministers were, later, exchanged with other states. The Brit. Gov. in Ottawa is now represented by a high commissioner. C. now has twelve ambas. and eight ministers in diplomatic posts abroad, in addition to various consuls, consuls-general, etc. There are Canadian ambas. in the U.S.A., France, Brazil, Argentine, China, Russia, Chile, Mexico, Peru, Belgium, Greece, the Netherlands, Italy, and Turkey. C.'s embassy in Moscow has been for some time administered by a Canadian chargé d'affaires. C. has ministers appointed to Luxembourg, Cuba, Norway, Denmark, Poland, Czechoslovakia, Sweden, and Switzerland. The legations in both Poland and Czechoslovakia, however, have been for some time in charge of chargés d'affaires. See also WESTMINSTER, STATUTE OF.

(b) *The Provincial Governments.*—In each prov. the king is represented by a lieutenant-governor, who is appointed by the governor-general in council, and who governs with the advice and assistance of his Ministry or Executive Council. The council is responsible to the Legislature and resigns when it no longer has the confidence of that body. The Legislatures have only one Chamber, consisting of a Legislative Assembly elected by the people—except in Quebec, where there is also a Legislative Council. The Legislature in each prov. may exclusively make laws in relation to the following matters: amendment of the constitution of the prov., except as regards the lieutenant-governor; direct taxation within the prov.; borrowing money on the credit of the prov.; public lands belonging to the prov.; prisons, hospitals, charities, etc.; municipal institutions; shop, saloon, etc., licences issued for revenue purposes, local works and undertakings other than inter-provincial or international communications; companies having provincial objects; property and civil rights within the prov.; administration of justice within the prov.; generally all matters of a merely local or private nature in the prov.

The Canadian constitution was remarkably successful for a period of fifty years, while it was adapted to the conditions in C.; but since then conditions have changed so markedly that the constitution is no longer suited to the age. For when the constitution was framed it was a compromise between those who wanted a strong federal authority and those who thought that it was essential to the success of confederation that Quebec should have control of all those matters in which that prov. differed and indeed still differs from the others, and that consideration should be given to the fears of the remaining provs. lest they should lose their powers. Hence certain specified powers were assigned to the federal gov., certain other specified powers to the provs., and all residuary powers were left to the federal gov. In this century the tendency has been to interpret the constitution in such a way as to strengthen the authority of the federal or central gov.: this being in accord with the movement of public

opinion which, since the first decade, has been shifting the emphasis from liberty to power. Again, in 1864, when the constitution came into being, trade in C. was mainly local; to-day it is dominion-wide. The power of the dominion gov. is no longer adequate for the effective control of trade and industrial activities, nor for the carrying out of international agreements. Conversely, the development of the social services, which appertain to the provincial authorities, has been so great that the financial provisions made for the provs. at the time of confederation have become quite inadequate. By the close of the inter-world war period the need for a change in the relations between the central and provincial govts., especially in relation to the division of taxing powers, was generally recognised. In 1937, the federal gov. appointed a commission, known as the Rowell-Sirois commission, to report on conditions and make recommendations. Its terms of reference were to make 'a re-examination of the economic and financial basis of confederation and of the distribution of legislative powers in the light of the economic and social developments of the last seventy years,' and 'to express what, in their opinion, subject to the retention of the distribution of legislative powers essential to a proper carrying out of the federal system in harmony with national needs and the promotion of national unity, will best effect a balanced relationship between the financial powers and the obligations and functions of each governing body, and conduce to a more efficient, independent, and economical discharge of governmental responsibilities in C.' The commission's report was pub. in May 1940 and the ensuing federal-provincial conference to discuss the recommendations dispersed in violent disagreement. During the war C.'s problems grew in intensity and importance, but the federal gov. overcame difficulties with the provs. partly by agreement and partly by orders-in-council. A second, and post-war conference was more successful, the federal gov. offering a plan whereby the provs. by a voluntary surrender of a portion of their powers, might meet the difficulties of the altered situation. Committees were appointed to consider the offer and a third conference met in 1946. The dominion-prov. conference on taxation and reconstruction adjourned in 1946 without coming to an agreement. Ontario and Quebec led prov. objections to dominion proposals that in return for specified unconditional payments to the provs., the provs. would undertake, for the next three years, not to levy income, corporation, and succession duty taxation, with the proviso that any prov. which wishes to continue to levy succession duties might do so on condition of the dominion payment being appropriately reduced. Counter proposals that in return for cession of these tax fields the federal gov. give up taxation on such items as gasoline, amusements, electricity, etc., were not acceptable to the dominion gov.

Public Finance.—At confederation other revenues which had previously accrued to the treasuries of the prov. were transferred to the dominion, notably the customs duties; and the public works and other property of the provs., except lands, mines, minerals and royalties, also became dominion property. The dominion became responsible for the debts of the provs., and therefore had thenceforth to pay ann. subsidies to the provs. for the support of their govts. and legislatures. In addition to these assured subsidies, which have been increased from time to time, the provincial govts., through retaining the ownership of their lands, minerals, and other natural resources, raise considerable revenues through land sales, sales of timber, mining royalties, leases of water power, etc., while the prairie provs. receive from the dominion special grants in lieu of land revenues. Negotiations for the transfer of the lands and other natural resources of the prairie provs. to the gov. of the respective provs. were completed in 1930. Further, under the British North America Act, provincial Legislatures are authorised to impose direct taxation within the prov. for provincial purposes and to borrow on the sole credit of the prov. C.'s net debt (1944 was estimated at \$8,842,000,000.

History.—John Cabot had reached the shores of C. in 1497, but in 1534 Jacques Cartier, a Frenchman, undertook a voyage of discovery along the coasts of Newfoundland and Labrador, and on his second voyage (1536-37) discovered the St. Lawrence R. and travelled as far as the Indian cap., Hochelaga. Some small settlements were made by the Fr., but abandoned after two years, and it was not till 1608 that Samuel de Champlain, who had visited the country in 1603 and subsequent years, founded the city of Quebec. The St. Lawrence region formed a Fr. colony under the name of C. for the next century and a half, but the Eng. Hudson's Bay Company was formed in 1670, and began to carry on trade with the Indians in the N.W. Ter. Halifax in Nova Scotia was founded in 1749, and a Brit. governor was set over a number of Brit. who had emigrated thither. The struggle between the Fr. and the Eng. for the possession of the N. Amer. continent was lengthy and determined, but the momentous struggle with the Fr. came to a victorious end with the battle of the Heights of Abraham, and the decision virtually made by that battle was confirmed by the treaty which ended the Seven Years war. The life of Wolfe had not been spent in vain, and the passing of that hero synchronised practically with the estab. of the dominion of C. By the treaty of Paris of 1763, C. and the disputed lands between the Mississippi passed for ever into the hands of the Eng. The Fr. colonists were allowed to sell their property and return to France if they wished, but above all they were granted complete freedom of worship, and on the whole C. remained satisfied. During the Amer. war they remained loyal, a loyalty which was

chiefly due to the fact that the Quebec Act of 1774 confirmed their right of worship in their old Catholic faith, and they were also allowed to hold land according to the system of anct. France. Thus pacified, they gave no help to the rebels, and rather regarded the possible inclusion of C. with the revolting colonies as a misfortune which was to be avoided at all costs. The settlement of what is now the prov. of New Brunswick took place about this time as a result of the driving of the loyalists from America (U.S.A.). The colonists, loyal though they were, however, insisted upon a recognition of their constitutional rights, and they demanded self-gov. in local affairs. This they were granted by the Constitutional Act of 1791, which divided C. into an upper and a lower prov., both of which had a representative assembly.

During the war with the U.S.A. both provs. remained loyal and helped to repel the invasions of the Amers. The boundary between C. and the U.S.A. was first defined by another treaty of Paris in 1783 at the end of the Amer. War of Independence. But following on the war we find a state of affairs which boded ill for the mother country. The colonists were discontented and aggressive; their discontent showed itself in the rebellions of Papineau and Mackenzie, both of which were futile. But the opening of the reign of Queen Victoria did not give prospect of an immediate relief of the situation. Bloodshed and discontent were rife; something must be done which would help in the settlement of C. Lord Durham, who was sent out to investigate matters, suggested that the colony should be granted responsible gov., and a legislative union of Upper and Lower C. took place. The Fr. party for some considerable time held the balance of power, and the rioting at Montreal in 1849 led to the removal of the Legislature first to Toronto and Quebec alternately, and finally to Ottawa. For some time there was a considerable movement in favour of union with the U.S.A., but a reciprocity treaty with U.S.A. in 1851 put an end to this movement. After many difficulties and many deadlocks between the great political parties, the British North America Act was passed by the Brit. Parliament in 1867, and the dominion of C., consisting of Upper and Lower C., New Brunswick, and Nova Scotia, came into being. Prince Edward Is. and Newfoundland dropped out of the scheme at the last moment. There were many reasons for this federation, the chief perhaps being that the fear of Amer. aggression made the colonists feel that united action would safeguard the interests of them all. The new additions were of great value to the colonists of Upper and Lower C., and the federation went far to establish a really strong Brit. possession in N. America. Since the Confederation, the Canadian Gov. obtained in 1879 the right to give a preference in tariffs to another colony (or dominion), in 1881 the right of representation when treaties concerning her

interests are being discussed, and in 1897 the right to demand that a treaty which she considers inimical to her interests should be abrogated. In the meanwhile occurred two rebellions of the half-breeds led by Riel, one in 1869 and the other in 1885; the second was the more dangerous, but was put down, and Riel was executed. Again, since the Confederation, in face of many difficulties, the dominion has gone on incorporating new provs. and stretching her boundaries to the N. and to the W. The Hudson Bay ter. was incorporated. Brit. Columbia joined the dominion, and step by step the whole of the present ter. of the dominion was incorporated.

Progress in the last sixty years has been fairly rapid, particularly in the twentieth century, though the primary resources of the country are still practically untouched. Between the years 1881 and 1885, in spite of opposition in the face of the greatest difficulties, the Canadian Pacific Railway was built, and amongst the names which stand out above all others at this time are to be remembered the names of Lord Strathcona, Lord Mount Stephen, and Sir John Macdonald. The latter, after leading the Conservative party in C. successfully for many years, *d.* in 1891. He had faced many critical movements, but he had been true to his policy of faith in C. and the Brit. Empire. His death broke up the Conservative party, and in 1896 Sir Wilfrid Laurier and the Liberals were returned to power. They remained in office until 1911, when their policy of reciprocity was defeated and the Conservatives under Mr. (later Sir Robert) Borden were returned. During the crisis of the S. African war the Canadians showed their loyalty and sympathy, and the deeds of valour of the Canadian contingents raised C. to the position of one of the leading forces in the Brit. Empire. This loyalty was further demonstrated, in striking manner, on the outbreak of the First World War, the first Canadian contingent landing at Plymouth on Oct. 16, 1914. This contingent landed in France in Feb. 1915, and fought at the second battle of Ypres, April 22, at St. Julien, April 24, Festubert, May 20-26, Givenchy, June 15. In Jan. 1916, an increase in the number of Canadian troops to 500,000 was authorised. Actually, 595,000 men were raised, of whom 418,000 went overseas, while over \$1,000,000,000 worth of munitions were supplied to the allies by Canadian factories. Other notable battles in which the Canadians played a prominent part were the capture of Vimy Ridge, Loos, the capture of Hill 70, Passchendaele, the Somme (March 1918), Amiens, Monchy le Preux, Drocourt-Quéant 'switch' (*q.v.*) line, Bourlon Wood, and Cambrai (*q.v.*). During the period of the war the Houses of Parliament at Ottawa were destroyed by fire (Feb. 1916), and there was a disastrous explosion of munitions at Halifax, N. Nova Scotia (Dec. 1917). In the year following the war, the Prince of Wales made an official tour of C., opening Quebec Bridge on Aug. 22 and laying the foundation stone of the tower of the new Parliament

buildings at Ottawa. In the same year the Canadian National Railways were organised. Sir Robert Borden was succeeded by Mr. Arthur Meighen as Premier in 1920, but his Conservative Ministry soon fell, and Mr. W. L. Mackenzie King, Liberal, became Premier (Dec. 1921), and held office till 1926, during which period there were two Imperial Conferences (1923, 1926) at which he represented C.; a trade agreement was signed between C. and the Brit. W. Indies (1925), and Lord Byng of Vimy (*q.v.*), 1921, was made governor-general. In 1926 Mr. Meighen once again became Premier, but was defeated in the House immediately and resigned. The taxation issue and that of protective tariffs remained the dominant note in Canadian politics, neither party having any very clear advantage in majority, but in 1930 Mr. King was severely defeated at the general elections, Mr. (later Lord) Bennett (*q.v.*) becoming Prime Minister at a time of somewhat serious unemployment and pledged to an upward revision of tariffs, to exclude, especially, imports of manufs. from the U.S.A. In Oct. 1930 Mr. Bennett came to London at the head of the Canadian delegation to the Imperial Conference, the prin. issues being economic and constitutional (inter-Imperial relations).

C. suffered with other countries in the world economic crisis which began in 1929. Factories closed, the wheat market collapsed, and the demand for manufactured and agric. products fell to disastrous levels. The prairie farmers were especially hard hit and the wheat pools faced great losses. The provincial govts. came to their aid and by 1932 they were operating again as co-operative elevator companies. After the depression a drought set in, bringing eight years of successive crop failures, while soil erosion aggravated the loss, high winds blowing the scorched and crumbled earth for great distances. By 1933 thousands of farmers were on relief, their savings wiped out, and innumerable farms were abandoned. The year 1930 marked the end of the era of the rise of the wheat empire, which had begun with the construction of the railways and though grain must continue to be important, the W. had other resources awaiting development. It was in this year, too, that the natural resources, which hitherto had been kept under the control of the dominion gov., were transferred to the prairie provs. In 1930 Mr. Mackenzie King and the Liberals, who had been in office for five years, were defeated and the Conservatives, under Mr. R. B. Bennett (now Lord Bennett) a lawyer from Calgary, assumed office. The depression also encouraged new political movements. In Alberta the Social Credit party (*q.v.* and see also ALBERTA) advocated drastic changes in the control of banking and money and gained control of the provincial legislature. The Co-operative Commonwealth Federation, organised in 1933, advocated a wide extension of public ownership and a great extension of the social services. Despite the depressing features of the economic crisis these years

were not devoid of substantial achievements: the Prairie Farm Rehabilitation Act of 1935, passed by the Conservative gov., provided for a programme of research through the co-operation of dominion and provincial govts. Through the efforts of farmers and scientists, the line of agriculture was extended gradually further N. towards the Arctic circle. Radio and flying, too, helped in the expansion northward, freight being carried through the N.W. Ters. and even to the Arctic Is. McMurray, at the end of the railway, 300 m. N. of Edmonton, became the gateway to the Mackenzie, and from there the airline reached N. 1600 m. to Aklavik on the Arctic shore; but the full effects of this expansion northward has not yet been realised. In 1932 a national broadcasting system was estab., and four years later it was reorganised under the Canadian Broadcasting Corporation—a combination of private ownership and state control. The overwhelming Liberal victory in the provincial elections of 1934 was followed by Mr. Bennett's heavy defeat in the general election of 1935 when Mr. MacKenzie King once more became Premier. Lord Willingdon succeeded Lord Byng as governor-general in 1926 and was himself succeeded by Lord Bessborough in 1931. In 1935 Lord Tweedsmuir (John Buchan) became governor-general, and was in office until his death during the Second World War. In 1937 Mr. King and his Cabinet appointed a Royal Commission to study the problem of dominion-provincial relations. The outcome was the most thorough investigation since confederation. The commission's report, generally known as the 'Rowell-Sirois report' recommended a change in the financial relations of dominion and provs. by which the dominion gov. would collect more of the country's taxes, but would assume more responsibility for social services and prov. debts; but these proposals were not universally approved, and when the country became involved in war in 1939, the whole question was shelved. This was also the period of constitutional development in C. as in the other dominions affected by the Statute of Westminster passed in 1931 (q.v.). In the case of C. and at the express wish of the Canadian Gov., two limitations with regard to the British North America Act, that is, with regard to the Canadian constitution, remained despite the Statute: (a) amendments were still to be made by the Brit. Parliament, which, however, would act only at the request of the Canadian Gov.; (b) legal cases involving the interpretation of the British North America Act could still be taken on appeal to the judicial committee of the Privy Council as the highest court of the empire. These limitations were to be removed whenever C. wished, and were retained because no method of amending the constitution had been found which was approved by all the provs. As the Statute of Westminster, by repeating the principle of the Crown as the symbol of the free association of members of the Brit.

Commonwealth, demonstrated that the Crown was the only legal link binding the members together, it was as king of C. that George VI. made his royal tour in 1939 and addressed the Canadian Parliament in Ottawa. In this transformation from Empire to Commonwealth C. has always played a leading part. 'Since the time of Durham she had been the chief laboratory for the great experiment of colonial self-government which, after a century of trial and error, had finally been brought to its logical conclusion' (George W. Brown). The years 1931 and 1935 were internationally disastrous by reason of the Jap. invasion of China and Mussolini's invasion of Abyssinia—events which sorely tried the efficacy of the League machinery. In 1938 Germany, profiting by the divs. among her adversaries, invaded Austria. With Germany's invasion of Poland the Second World War began.

But C.'s share in these events was a minor one, though more important than, perhaps, was suspected by Canadians. Thus public opinion strongly condemned the Jap. aggression, and the Canadian Gov. supported the protest made by the League. But it was not thought that any further step was necessary—C. was not a great power and the country was not yet entirely free from the effects of the depression. Yet none the less C., like other countries, was being hastened towards war during these critical years by force of circumstances and also by policies in the formulation of which she had no part. Canadians had yet to learn that peace is indivisible and that war, like a bodily disease, infects the whole body. The royal tour of King George and Queen Elizabeth in N. America in 1939 was a striking sign of the new spirit of understanding among the nations of the Brit. Commonwealth and between Britain and the U.S.A. This better understanding, however, did not manifest itself so much in common policies as in the tacit recognition of common interests which in the long run went deeper. The royal tour made this abundantly clear, and to millions the royal pair became a symbol of the meaning not only of the Brit. Commonwealth but of Brit. democracy. Thus, as the clouds of war darkened the horizon of Europe, there emerged signs not only of a better understanding between Britain and the U.S.A., but of a common determination that the U.S.A. and C. would stand together in defence of N. America against the menace of aggression. On Sept. 10, 1939, the Canadian Parliament resolved that the king should declare a state of war between C. and Germany. C. thus ranged herself with Britain and other members of the Commonwealth in the defence of freedom.

Along among the nations of America, she entered the war at its inception, believing that not only her destiny but that of the world was at stake. Events were to show that her belief was well founded. C. had small but well-organised forces which could soon be

expanded; but otherwise she was virtually unprepared. Yet by the spring of 1942 she had in her active service force more than 265,000 volunteers who had enlisted for service anywhere in the world. (See under *Defence*, above.) Canadian detachments served in Newfoundland, Iceland, the W. Indies, and Hong Kong, but most of the forces overseas were stationed in the Brit. Is., whose defence was essential to victory and whose shores were the only base from which an invasion could be launched in N.W. or W. Europe. From the time, a week after the declaration of war, that C. co-operated in protecting the first convoy, the expansion



Fox Photos

THE FIRST CANADIAN SOLDIERS IN ENGLAND, DECEMBER 1939

of the Canadian navy became one of the most striking achievements of her war effort. In the first three years of the war, Canadian naval operations extended not only to home waters, but to the Caribbean, Mediterranean, and the waters around Great Britain. Canadian ships shared in the Dunkirk evacuation, and Canadians attached to the Royal Navy participated in the heroic if desperate operations off Gk. and Cretan coasts. But C.'s most remarkable contribution was that which was associated with the Royal Canadian Air Force. In the autumn of 1939, at the suggestion of the Brit. Gov., the Brit. Commonwealth Air Training Plan was estab. for the training of airmen from all over the self-governing empire. The plan was placed under the administration of C.'s National Defence for Air, and Canadian airfields were chosen as the scene of operations because her geographical position gave immunity from the threat of enemy bombers. This plan became a major factor in determining the course of the conflict. Meanwhile

Canadian airmen were fighting on widely scattered fronts. Large numbers attached to Brit. squadrons fought over Britain, Europe, the Mediterranean areas, and Russia; and, in addition, nearly a score of Canadian squadrons were in action overseas by early 1942. Within two years of the beginning of the war hundreds of Amer.-built bombers were being flown as a matter of course from Newfoundland to Britain. But not until after Dunkirk was the full significance of Canadian industry realised. Tanks, aeroplanes, and innumerable articles of mechanised equipment were required immediately. From this point began a transformation which in less than two years completely geared Canadian industry to the war effort.

New factories were built and old ones converted to war purposes. Tanks, aeroplanes, guns, munitions, and masses of other articles were produced in a volume unprecedented in C.'s hist. On E. and W. coasts and in the ports of the Great Lakes, a ship-building programme was undertaken to produce hundreds of ships, vessels of all sizes from motor torpedo boats to large freighters. The corvette, fast and well armed, was the special contribution in this regard to the campaign against the Ger. U-boat menace. Canadian finance, too, was mobilised completely to meet an enormously increased burden. By mid 1941 Canadians, through taxes and war loans, were contributing 40 per cent of their income to war purposes. A landmark in Canadian hist. was the creation on Aug. 18, 1940, by C. and the U.S.A. of the Permanent Joint Board of Defence, through an agreement signed at Ogdensburg by Mr. Mackenzie King and President Roosevelt. By this agreement the signatories in effect declared their determination to co-operate fully 'in the defence of the N. half of the W. Hemisphere.' The Ogdensburg agreement marked a new stage not only in the relations of C. and the U.S.A., but in the relations of the U.S.A. with the Brit. Commonwealth. For the first time in her hist. the U.S.A. had signed a permanent military agreement with a member of the Commonwealth, and had recognised C. as her closest friend and associate. For the first time, too, C. had shown that she was bound to join with her neighbour in defence of the common continent while she was free also to stand by other Brit. nations overseas.

Early in 1946 public confidence in Russian integrity was shaken by the 'Soviet spy case.' Mr. Mackenzie King in the Commons (Feb. 15, 1946) said that information had reached the gov. which estab. that there had been disclosures of secret and confidential information by unauthorised persons, including some members of the staff of 'a foreign mission' in Ottawa, and the gov. had appointed Justices Taschereau and Kellock of the Supreme Court as royal commissioners to report on the case. The Soviet Gov., which had not been named, hastily averred that the information they had

received from Canadian citizens concerned technological data which the Soviet authorities did not need, as the U.S.S.R. 'possessed higher technological achievements and which could be found in available pubs. on radiolocation, etc., and that the Soviet ambas. and the other members of the Soviet embassy were in no way concerned—the persons concerned being some employees on the staff of the military attaché who had been recalled.' On Feb. 23 the Royal Canadian Mounted Police detained thirteen persons, including two women, in connection with the inquiry being undertaken by the commissioners. The commissioners in their first interim report (March 4) stated that the evidence proved the existence of a network of under-cover agents for the purpose of obtaining secret and confidential information from Canadian Gov. employees, and that these operations were carried on by members of the staff of the Soviet embassy in Ottawa under direct instructions from Moscow; and that the person in charge of those activities was the military attaché, Col. Nicolai Zabotin, and staff. The commissioners had evidence from one, Igor Gouzenko, cipher clerk to the military attaché, who had described the organisation and produced original documents which showed that specific tasks entrusted in Aug. 1945 by Moscow to Zabotin included those of obtaining information on technological processes in connection with the production of explosives and chemicals; data in connection with the materials of which the atomic bomb was composed; and particulars of the plant at Chalk R., Ontario, and the processing of uranium, etc. The evidence estab. that four persons had communicated information to Soviet representatives in violation of the Official Secrets Act, 1939. One was a woman of Russian origin, employed as a cipher clerk in the Dept. of External Affairs. The second, interim report stated that evidence had been heard from four more persons under detention, including Dr. Raymond Boyer, an assistant prof. of chem. at McMill Univ., who had admitted that in 1943 and 1944 he had given full information on his scientific work for transmission to the Soviet Union. This work was in connection with the new explosive RDX, research into which was conducted by the National Research Council. All these four additional persons detained held positions of trust. On March 14-15 F. Rose, Labour-Progressive (Communist) member for Montreal-Cartier in the Canadian Commons was also arrested and charged with conspiring with Dr. Boyer and others. In a full statement in the Commons on March 19 Mr. MacKenzie King said that the documents in the case disclosed *inter alia* that C. was being made 'a base to secure information on matters of very grave concern to the U.S.A. and to Great Britain and that information was being sought through agents in Canada with respect to matters of the utmost concern to Canada, the

U.S.A., and the United Kingdom.' On March 29 the commissioners issued their third interim report naming five more persons. A few days later the Soviet embassy issued a statement describing Gouzenko as a 'criminal' and asserting that his statements were slanderous and fictitious. Dr. Boyer and most of the others charged were committed for trial and eventually convicted and sentenced to varying terms of imprisonment (*see Report of the Royal Commission*, pub. June 27, 1946, by the King's Printer and Controller of Stationery, Ottawa).

The question of the possibility of Newfoundland's entry into the Canadian Confederation began to be mooted in Canadian political circles as early as 1943, and in July of that year Mr. J. W. Noseworthy (a member of the Co-operative Commonwealth Federation party), himself of Newfoundland birth, urged in the Canadian Commons that the time was ripe for union between Newfoundland and Canada and he asked that immediate steps should be taken to bring about that union. Mr. MacKenzie King, in reply, declared that any discussions on the subject ought to be initiated by Newfoundlanders rather than by Canadians, but that 'if the people of Newfoundland ever decide that they wish to enter a Canadian Federation and should make that decision clear beyond all possibility of misunderstanding, Canada would give the most sympathetic consideration to the proposal.' After the war Newfoundland elected (autumn, 1946) a national convention to make recommendations to the Brit. Gov. as to the possible forms of future gov. to be submitted to the people of Newfoundland at a national referendum—the three alternatives being the continuance of commission gov., reversion to dominion status, or federal union with C. The convention did not in fact recommend confederation as one of the alternatives to be put to the people; but the secretary of state for commonwealth relations in London decided that in view of the existence of a strong body of opinion in the is. in favour of it, and also because the convention had sent a delegation to C. which had resulted in terms of confederation being offered by the Canadian Gov., confederation should be put to the people. The first referendum showed that there was no substantial body of opinion in favour of a gov. by commission, while the other two alternatives polled more or less equal votes; but as a result of the second referendum the confederation proposal secured the necessary majority. The Canadian Gov. intimated that they would receive representatives of Newfoundland to discuss terms and the Newfoundland Gov. appointed a delegation for that purpose. The terms of agreement for bringing Newfoundland into the confederation were signed in Ottawa on Dec. 11, 1948, by representatives of the Canadian Gov. and the Newfoundland delegation, the operative date for union being March 31, 1949, subject to the terms of the agreement being approved by the Canadian Parliament and by the New-

foundland Gov. The Canadian Commons having passed the necessary resolution, and the Newfoundland Gov. also assenting to the terms, the Brit. Gov. in accordance with the joint request of C. and Newfoundland, gave its assent to union by an Act of Parliament confirming the agreement. Under the agreement the services taken over by the dominion gov., thereby relieving the new prov. (now the tenth prov. of C.) of the public costs incurred in respect of them after they had been taken over, were: the Newfoundland Railway, including some shipping and other marine services; the Newfoundland Hotel; telegraphic services; civil aviation; customs and excise; defence; protection of fisheries; geological, topographical, geodetic and hydrographic surveys; light-houses, buoys, and beacons; radio broadcasting system; and some other public services.

This proved to be the last political achievement of Mr. MacKenzie King. In 1948 there were rumours that, for health reasons, he proposed shortly to retire from active participation in politics. He had already held the reins of gov. in C., in combined periods, for a greater number of years than any other prime minister in the world. He visited London in Oct. 1948 to take part in the Dominion Premier's Conference, but was unable to attend, and soon afterwards he announced his retirement. He was succeeded as Prime Minister and president of the privy council by the Rt. Hon. Louis Stephen St. Laurent, K.C.

Literature.—Canadian literature, both Eng. and Fr., emerged late. A national literature presupposes a mature society. C., while it has achieved political autonomy, still awaits adulthood. Its ter. is so vast, segmented by geography, and varied in its ethnic communities, that the arts and letters of C. are bound to be regional. The entry of Newfoundland into the confederation, and the increasing importance of the Arctic, still further underline that fact. Racial and religious differences suggest no early or easy fusion of Canadians into a homogenous people. Yet there is slowly appearing a distinguishable type. No other part of C. has produced anything like the self-conscious culture of Quebec, *la petite patrie*, compounded of race and religion, the determination to survive unchanged, the age-old preoccupations with the altar, hearth, and the traditions of the folk.

1. **English Canadian Literature.**—Following the Conquest, Brit. settlement largely consisted of isolated communities of immigrants. Some communities were deliberately segregated units of Highland Scots Catholics, others were Congregationalists or United Empire Loyalists. Each was jealous of its rights and tenacious of its folk-ways. The Puritan tradition of Congregationalism, and of New England colleges, emerged in Rev. Henry Alline, the poet of rapture and revolt, founder of the Maritime Baptists, and in Rev. Jonathan Odell, Tory satirist of Nova Scotia. The Tory mind of the Loyalist contrived a political

and social structure in Ontario. All this has developed into a congeries of regional patterns. For many years these cultural is. remained obstinately colonial, their writers and artists derivative in style, and their work saturated with nostalgia for other days and other ways. Subject to Westminster, fearful of the incipient imperialism of Washington, the young nation became inhibited and retarded. Divided in language and religion, overwhelmed by geography, by distance and sharply contrasting interests; escaping the blood-bath of crisis, and the purge of revolution that welded other conglomerate states; missing the liberal and progressive movements following Darwin, C. was late in awakening. Its survival of the shattering blow of the First World War was a miracle. It not only survived, but its greatness dates from then. Before then neither Canadian hist. nor Canadian literature received any recognition at a Canadian univ. The Canadian Authors' Association was born in 1920.

Eskimo and Indian culture have had no effect upon Canadian literature. The earliest, and still in some ways the best, books were the personal accounts of their travels by the great explorers—Cook, Thompson, Vancouver, Harmon, and so on down to Tyrrell, Stefansson, and others. It is a roll-call of immortals, and through such series as *The Makers of Canada, Canada and Its Provinces*, and *The Champlain Society publications*, the record is known round the world. To these annals may be added the travel books of authors and artists—Mrs. Sincoo, Mrs. Jameson, the Strickland sisters, Kane, Catlin, Heriot, Morris, and so on to Fredrick Philip Grove and Philip H. Gossett.

The first native-born Canadian poet, Oliver Goldsmith, a grandnephew of his Irish namesake, pub. *The Rising Village* in 1825. Eng., Scots, and Irish *émigré* poets, Kirby, McLaughlan, McGee, and many others were pale imitators of Scott, Byron, Gray, and Burns. Then appeared Charles Sangster and Charles Mair, the first consciously Canadian poets, followed by Isabella Valancy Crawford, and Canadian literature had at last begun. The preoccupation of Mair and Crawford with people, especially pioneer types, gave way to the Group of the Sixties, a *roman à la mode* of nature poetry. The chief men of letters were born around the sixties: Wm. Henry Drummond, Albert Durrant Watson, Pauline Johnson (Tekahionwake), Sir Charles G. D. Roberts, Bliss Carman, Archibald Lampman, Wm. Wilfred Campbell, Duncan Campbell Scott, Frederick George Scott, and Tom MacInnes. These poets were unchallenged. Their work inspired political orators, educationists, and the emerging arts. Following this 'golden age' came Theodore Roberts, Robert W. Service, Francis Sherman, John McCreas, Wilson Macdonald, Marjorie Pickthall, and E. J. Pratt. With Sherman the pre-Raphaelites died, with Pickthall the Celtic twilight faded, and with Pratt a fresh wind swept through Canadian letters,

The foundation was laid for the birth of the Montreal group. In no country have groups counted for so much, since they guaranteed comradeship and sympathetic understanding in a vast, lonely, and indifferent land. The Montreal poets, A. J. M. Smith, Leo Kennedy, A. K. Klein, and Frank Scott, opened wide the doors for the new day, and the movement gains strength every year. Raymond Knister was in a sense a founder of the movement; while belonging to it in time, but not in spirit, are Arthur Bourinot and Audrey Alexandra Brown. The new voices are many and varied, and a few of them seem destined for greatness. Among the more experienced of these poets are Earle Birney, Charles Bruce, Dorothy Livesay, Anne Marriott, P. K. Page, Patrick Anderson, Raymond Souster, L. A. Mackay, Louis Dudek, and James Wreford. The influence of Auden, Eliot, Spender, Thomas, and Pound has supplanted Wordsworth, Browning, Arnold, and Swinburne, but the poets are finding their proper themes, and are communicating something that is definitely a part of the new dominion and the new age.

For a long time fiction was the most representative of the literary forms, but it became too prolific and superficial and ceased to have any influence upon Canadian life. Wm. Kirby's *The Golden Dog* (1877) and John Richardson's *Wacousta* (1832) worked the Fr. regime and gained international recognition, as did Thomas Chandler Haliburton's *Sam Slick* (1837-40). There were many imitators until Sir Gilbert Parker's romantic tales ended the romantic cycle. *Sam Slick* fathered an entire age of preposterous nonsense in the humour of the U.S.A. Sentimentality continued in the novels of L. M. Montgomery, Ralph Connor, Nellie McClung, Arthur Stringer, Theodore Roberts, Marjorie Pickthall, and Lacey Amv, and in a multiplying group of regionalists. Norman Duncan, Robert Stead, and Laura Goodman Salverson. With the First World War came a profounder understanding of life and character, and the novels of Mazo de la Roche, Raymond Knister, Morley Callaghan, Frederick Philip Grove, Thomas Raddall, Gwethalyn Graham, Philip Child, and Hugh MacLennan, all of whom found markets abroad. The development of the Canadian novel illustrates the slow maturing of Canadian culture. It also illustrates the mid-position C. holds between the thought and life of the U.S.A. and the United Kingdom. The nature story, invented by Sir Charles G. D. Roberts, and taken up by his contemporaries, Ernest Thompson Seton, Marshall Saunders, W. A. Fraser, Arthur Heming, 'Grey Owl,' and others, was imitated everywhere. The earliest essays by Howo and others were either newspaper editorials or speeches, those of Goldwin Smith preachments, the essays of Sir Wm. Osler convocation talks, those of Thomas O'Hagan and John Reade polished journalism, Archibald MacMahan's superior tales of character and

incident. Sir Andrew Macphail and Cecil Francis Lloyd wrote literary essays in the high tradition, and W. A. Deacon began as one of our most charming casual essayists. Pelham Edgar was a commentator on letters, Peter McArthur a chronicler of the farm and countryside, Grove's descriptive pieces, Emily Carr's *memorabilia*, W. H. Blake's fishermen's tales, and E. K. Brown's critical papers indicate growing competence and ripeness. Canadian drama has had a fitful career. Charles Mair, Wm. Wilfrid Campbell, and Robert Norwood, poets with no knowledge of the stage, wrote a literary drama that is neither read nor acted. Marjorie Pickthall's *The Wood-carver's Wife* was the firstactable one-act play in verse, and synchronised with the emergence of the little theatre movement in Brit. Columbia, Montreal, and Toronto. With stages available welcoming experiment, drama clubs and leagues came into being, with new playwrights and ultimately the Canadian drama festival. From the biblical Shakespearean five-acters of Charles Heavyside to Merrill Dennison and Lester Sinclair is an entire age. The development of a Canadian type of humour in prose and verse, and in painting and sculpture, points to the growing maturity of the Canadian people. From T. C. Haliburton to Thomas Langman, from W. H. Drummond, Stephen Leacock, and R. W. Service to John Robins, E. J. Pratt, Watson Kirkconnell, B. K. Sandwell, and Robertson Davies is a long step. Canadian arts and letters still lack confidence in the presence of humanity.

2. French Canadian Literature.—During the Fr. regime there was no literature save the *Relations des Jésuites* and similar correspondence of rival religious orders printed in France. There was no printing press in C. under the Fr. kings, just as there was none for a long time in the Amer. colonies under the Eng. kings. Since the Conquest Fr. Canadian letters have developed more rapidly as an autonomous art than in Eng.-speaking C. While they followed the models of *la mère patrie* for style, the content was Canadian. The Fr. Canadian lived alone in an alien world, fearful alike of anti-clerical and republican France, and of the Protestant and predatory Eng. colonies. Shepherded by the clerical and professional *élite* of his own people, growing more intensely Catholic and Fr., jealous of their rights and folk-ways, and resentful of all foreigners, Fr. Canadian arts and letters were surcharged with racial and religious emotions. While there were Huguenots among the founders of New France, they were gradually excluded, and Protestantism to this day has no impressive foothold in Quebec. There has persisted, however, a small anti-clerical element among the Fr., opposing a too-complete domination of life by the clergy, that has even its clerical adherents. The Catholic Church inspires and supervises every phase of Fr. Canadian life. It has been the chief patron of the artist and writer, and has inspired the Prov.

Gov. to extend its patronage to the arts and letters as no other gov. in C. has done. The constant pressure of race and religion tends toward a certain inbreeding and over-emphasis.

The pub. of Fr. Canadian books during the past twenty-five years has been astonishing, both as to quantity and quality. The craft of bookmaking stands very high. Journalism from the days of Michel Bibaud and Etienne Parent to the present has been conspicuous for its style, and the apostolic vigour with which it has sponsored the interests of the people. The father of Fr. Canadian letters was Etienne Parent, editor of *Le Canadien*, with its flaming legend 'Nos Institutions, Notre Langue et Nos Loix.' Hector Fabre, Arthur Bues, L. O. David, Henri Bourassa, J. P. Tardivel, J. C. Harvey, and T. D. Bouchard were all distinguished editors and journalists, and gathered about them the best poets and essayists of their day. The essayists in Fr. C. were no mere dilettantes. They were sensitive to style and good taste, but they nearly always sponsored a cause. Even literary criticism followed this tradition. No other literature devotes so much time to essays on writers and their books, to reviews of reviewers, but the central theme is often the same, evoking 'Our Master the Past,' communicating the will to survive, pledging loyalty to the imperishables. The list of writers in this *genre* is long, extending from Etienne Parent, Sir James LeMoine, and Hubert Larue, to Ernest Gagnon, Henri D'Arles, Louis Danton, Adolphe Rivard, Maurice Hébert, Mgr. Camille Roy, and Guy Sylvestre. Poetry, as in English-speaking C., has been the most representative branch of letters, both in volume and quality, and in the resulting influence upon the culture of the people. Frequently the models have been those of France, first the romantic and later the disenchanting, but for the most part only the pattern was borrowed. The content has remained persistently Canadian. From the doggerel of Michel Bibaud, the first poet, to Octave Crémazie, the first authentic poet, is a vast distance. The epic verse of Crémazie, the lyric of Louis Fréchette, the poetry of altar and soil of Pamphile LeMay, were followed by Wm. Chapman, Émile Nelligan, Albert Lozeau, Jean Charbonneau, Paul Morin, Alfred DesRochers, Paul Goun, Simone Routhier, Maurice Hébert, and Robert Choquette, increasingly competent in dealing with the lives of their own people. The novel began as a vehicle for the preservation of the faith and the folk-ways of the race and, while it has largely remained loyal to these ends, it has steadily developed as art. The distance between *Les Anciens Canadiens*, by Philippe Aubert DeGaspé, *Jean Rivard*, by Antoine Gérin-Lajoie, Laure Conan's *Angeline de Montbrun*, and Blanche Lamontagne's poems and novels and the modern novels of Louis Hébert, 'Ringnet,' Gabrielle Roy, Yves Thériault, and Roger Lemelin, to mention the most conspicuous, is considerable, but the genealogy is un-

mistakable. Their great strength is due to the fact that the authors are naturally but resolutely themselves, more and more a part of the world at large, but unwilling to forfeit the old faith for the new cosmopolitanism. The writing of hist. has been a profound maker of hist. in Fr. C., from the Anglophile Michel Bibaud, the first native-born poet and historian, on through F. X. Garneau, Abbé J. B. A. Ferland, Sir Thomas Chapais, and Sir James LeMoine, to Chanoine Lionel Groulx and Abbé Arthur Maheux. Hists., causeries, accounts of travel, tales of exploration, commentaries on men and events, lives of the *élite*—these have multiplied, some authors projecting single-handed entire series of vols. They not merely record events, but endlessly interpret them, underline their main lessons, and through them state and re-state the Fr. Canadian's case, always with deep emotion, often with distinction, and increasingly fairer to the other side. The contribution to Fr. Canadian solidarity of such biographers as Abbé H. R. Casgrain, L. O. David, Sir Adolphe Ronthier, Pierre Georges Roy, and Mgr. Olivier Maurault is incalculable. Publications on religion and theology, brochures conveying the mind of the Church on education, public morals, economic and industrial matters, sermons and inspirational literature, school texts and manuals of religious instruction, learned works of all sorts, are issued in swelling numbers, and often achieve great distinction of style and format. Drama is only now coming into its own, chiefly through the encouragement of the radio, and its strength is that its roots are in the native soil. The work of Yves Thériault is outstanding.

Eng. and Fr. letters in C. have tended more and more to go their own way, but there is a growing belief that ultimately the *bonne culture* will be consummated in a more perfect understanding. Eng. and Fr. Canadians are committed to live together as a people. The golden age of letters in England and France was born of a common source; in C. the two traditions meet again, and their roots are buried deep in a common soil. The idiom may vary, but henceforth the meaning will be increasingly the same.

Art.—Art in the colony of New France began about 1670 when the sojourning artist, Frère Luc (Claude François), transplanted the European style of religious painting into Canada. Shortly afterwards the more important art of sculpture in wood was introduced by Jacques Leblond de Latour and other carvers who came as masters to Bishop Laval's school of arts and crafts near Quebec. Though painting was for a century to remain in the thrall of folk art or the imitation of Europe, the carving of statues and of decorative work in churches developed in a more original way, reflecting but not imitating the Fr. style in its unfolding from the Louis XIV. to the Louis XVI. The Levasseur family in Quebec were the prin. exponent of this art during the era of relative isolation from France in the earlier eighteenth century. The art of

embroidery flourished under the nuns and often showed considerable originality.

The Brit. conquest of 1759 restored contacts with Europe to a limited extent. A reflection of Chardin and Fragonard was seen in Fran. ois Beaucourt, the first Canadian painter to study abroad. Later, in the first half of the nineteenth century, the portraits of Antoine Plamondon and Théophile Hamel showed the influence of the Fr. classicists. The Brit. tradition by this time had also begun to play its important part in the formation of Canadian art. In Nova Scotia Robert Field carried the methods of eighteenth-century Brit. portraiture into the early nineteenth century. In Quebec the carvers of the *Baillairgé atelier* and the silversmiths combined Eng. neo-classic motifs with their traditional Baroque elements to produce an original and splendid style.

Landscape painting, however, was the most important legacy of Brit. art. A considerable number of topographical artists, both professional and amateur, from Richard Short (1761) to William Henry Bartlett (1836), visited the colony and recorded the Canadian scene. These inspired the same pursuit on the part of resident artists such as Paul Kane (1810-1871), whose study of the landscape and Indian life took him from Toronto to the west coast and back again between 1846 and 1848. Cornelius Krieghoff (1815-72), who was in C. between 1810 and 1866, painted the Fr. Canadian scene in the picturesque manner which he had learned in Holland and at Düsseldorf, but he also recognised the broad patterns and bold colours which belong to the Canadian landscape.

Around 1880, the romantic picturesqueness of Kane and Krieghoff gave way to a naturalistic treatment of the Canadian scene which developed through the work of Allan Edson, Henry Sandham, and Lucius O'Brien (with affinities to both England and the Hudson R. school in the U.S.A.) to the realistic *genre* and portraiture of Robert Harris (1849-1919), also the painter of the first Canadian mural picture, 'The Fathers of Confederation,' in 1881. This movement coincided with the founding of the first official art organisations, the Royal Canadian Academy and the National Gallery of C. (1880). In the nineties, realism yielded to the richer, more poetic mode illustrated in Horatio Walker (1858-1938), the painter of *humilant genre* in the Barbizon manner; Homer Watson (1855-1936), a landscapist influenced by Constable; and Wm. Brymner (1855-1925), the painter of dreamlike landscapes with a kinship to Inness in the U.S.A. Realistic sculpture, as practised by Hamilton MacCortby (1847-1939), also gave way to the elegance of monuments of Louis-Philippe Hébert (1850-1917).

A younger generation of painters who saw in Fr. Impressionism a new approach to the Canadian landscape played an important part in launching the modern Canadian school. Maurice Cullen (1866-1934) eliminated the European haze of atmosphere in his later works in order to

express the emphatic contours and colour-patterns of the N. landscape. Marc-Aurèle de Foy Suzor-Coté (1869-1937) took steps in the same direction; he was also a sculptor who specialized in *genre* groups. James Wilson Morrice (1865-1924), who lived most of his life in Paris in contact with all movements from Whistler to Matisse, had the immediate effect in his native country of encouraging the flat pattern and a further reaching one in establishing the idea of 'pure' painting.

But the first movement in Canadian art to be identified as national was initiated by a group of young painters in Toronto in the years following 1910. A. Y. Jackson brought from Montreal the influence of Morrice as well as his own passion for discovery, the untrained Tom Thomson (1877-1917) a native genius and a profound understanding of the N. woods, Arthur Lismer and Franklin Carmichael (1890-1945) a feeling for rhythmic movement, F. H. Varley a mastery of paint, J. E. H. MacDonald (1873-1932) a poetry of interpretation, Lauren S. Harris a dynamic vision of the forces of nature. The Group of Seven (including the foregoing with the exception of Thomson, and with the addition of sev. others at different times between 1920 and 1933) felt the impact of impressionism, post-impressionism, and expressionism, but national feeling was the catalyst which fused these influences into a new style, austere, unquiet, and uncompromisingly regional, which was hailed in England and France during the twenties before it was accepted at home. Contemporaries of the group in other parts of C. included Albert H. Robinson, Clarence A. Gagnon (1881-1941), and Marc-Aur. le Fortin, whose patterning of the Quebec countryside constituted a much gentler, more lyric and decorative art, while Walter J. Phillips exemplified the same tendency in his colour woodcuts and water-colours. Two other artists of the same generation developed individual styles of the highest order. David B. Milne's delicate, imaginative, quiet manner depends on patterns of a simple and exquisite sort, and elusive colour harmonies as personal as handwriting. Emily Carr (1871-1945), who painted all her life in Brit. Columbia, underwent an astonishing expressionist development after brief contact with the Group of Seven. Her canvases and spontaneous sketches are expressions of her enthusiastic response to the stylized forms of the Indian totems and her excited reaction to the luxuriant growth of the W. forests.

Recent trends include a further development of the style of the Group of Seven along broader and more varied and personal lines on the part of one important group. Charles Comfort with his clean, efficient line, Carl Schaefer with his subtlety and intimacy in water-colour, Wm. Ogilvie with his delicate stylized figures, Jack Nichols with his delicate and pathetic ones, and Prudence Howard (1891-1947) with her powerful ones all stem from the 'austere' school. A number of *genre* painters have moved somewhat

away from this sphere of influence, yet are bound to it by their attachment to the Canadian scene: these include Henri Masson, André Biéler, Pegi Nicol MacLeod, and Jean-Paul Lemieux, among others. These are also interested in the folk artists or primitives, who include S. Mary Bouchard (1912-45) of the Bale-Saint-Paul group. Finally, a Montreal group which has grown up since 1939 looks to Morrice and to John Lyman as the patron saints of non-particular art and has been

Stewart. Some of the most recent endeavours of Canadian artists have been in the realm of the film and industrial design. Art societies, which have grown greatly in numbers and effectiveness during the past twenty-five years, have played an important part in the stimulation of Canadian art. The work of the National Gallery of C., which for many years has carried on a nation-wide programme of travelling exhibitions, is now supplemented by a growing number



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 'VILLAGE IN THE LAURENTIAN MOUNTAINS,' BY C. A. GAGNON

deeply influenced by contemporary European schools of 'pure' painting, abstraction, and expressionism, particularly of the school of Paris. It includes among others Alfred Pellin, Fritz Brandtner, Paul-Emile Borduas and Jacques de Tonnancour and Goodridge Roberts.

Sculpture has followed the same general pattern of development as painting. Walter Allward (Vimy Ridge Memorial), Frances Loring, Florence Wyle, Henri Hébert, Alfred Laliberté, and other contemporaries of the Group of Seven strengthened and simplified the forms of their figures, while Emanuel Hahn and Elizabeth Wyn Wood introduced landscape and other motifs from nature, stylizing them in an expressive manner almost to the point of abstraction. Contemporary sculptors exhibit a growing variety of influences, methods, and themes, as indicated by Sibyl Kennedy's elongated and expressive figures, Sylvia Daoust's decorative religious work, the powerful figures of Jacqueline Jones, and the incisive, nervous ones of Donald

of museums, galleries, and community centres.

Architecture.—Architecture in C. had its beginnings in the first dwellings of the St. Lawrence settlement in the seventeenth century. Unlike the wooden houses of New England, Canadian ones were built of stone. At the outset, they resembled buildings in the Norman Iles, and countryside, but about 1730 there appeared certain native features, the most noticeable of which was an exaggeration of the curving eave which, with the addition of posts, eventually formed the veranda. In only a very few buildings of the Fr. regime, designed by clerical amateurs or Fr. military architects, were there traces of the classicism of Paris; otherwise churches, religious houses, and dwellings alike shared a common simplicity of design.

The eighteenth-century Eng. settlements in the Maritime provs. followed a version of the Georgian similar to that found in New England, and Eng. influences mingled with local traditions in Fr. C. after 1759. The end of the eighteenth

century saw the introduction of the log cabin on the frontier, but in architecture reflected the Regency styles, with the Palladian version the favourite for larger buildings (Province House, Halifax, by John Merrick, 1811). The architects of this period were often Eng. military engineers (Quebec Anglican cathedral by Maj. Robe and Capt. Hall, 1804), but during the first half of the nineteenth century the Gk. revival spread into C. from the U.S.A., dotting the country roads with 'Temple-type' buildings (St. Andrew's, Niagara, 1831).

The Gothic revival began with Notre-Dame in Montreal, designed in 1824 by James O'Donnell with assorted Gothic details and Georgian proportions, and an elaborate carpenter's Gothic sprang up at the same time. But later architects such as Père Félix Martin (St. Patrick's, Montreal, 1847) and William Thomas (St. Michael's Cathedral, Toronto, 1845, St. Paul's, Hamilton, 1857) based their work on a closer study of Gothic monuments, while Frank Wills approached true medieval proportions in the cathedrals of Fredericton (1845) and Montreal (1857). The most imposing monuments of the revival were Univ. College, Toronto (by Frederick Wm. Cumberland, 1856), built in the Norman style which was then considered a variety of Gothic, and the Parliament Buildings at Ottawa, which show Ruskin's influence (by Thomas Fuller and Frederick Stent, 1859). In the sixties and seventies the Renaissance style was also revived, particularly for use in office buildings and ambitious dwellings. The influences until this time were predominantly Brit., but in the eighties the massive and functional 'Romanesque' which stemmed from Henry Hobson Richardson in the U.S.A. and was carried out in sombre red or brown stone, became widespread in C.

In the nineties the naïveté of earlier decades was replaced by a studied correctness of design. The architects who around 1900 founded their professional schools and societies, became conversant with a variety of styles, applying their accomplished Renaissance to office and legislative buildings (Saskatchewan Parliament, Regina, E. & W. S. Maxwell, 1910), their learned Gothic to churches and parliament buildings (New Parliament, Ottawa, John A. Pearson, 1919), the Classic to banks and railway stations (Union Station, Toronto, 1919, Ross & MacDonald, Hugh Jones and J. M. Lytle), the Georgian and Tudor to villas or the now familiar Fr. 'château style' to hotels—as site or function seemed to demand.

Skyscrapers—the Daily Star Building, Toronto, Chapman & Oxley, 1928; the Aldred Building, Montreal, Barott & Blackader, 1930; and the Canadian Bank of Commerce, Toronto, Darling & Pearson, 1930, are among the largest examples—which depended on structural steel and reinforced concrete, sometimes had the exterior of a cathedral or palace.

Evidences of a new style, which frankly acknowledged the new materials and techniques and expressed new functions,

were found in the early part of the present century in utilitarian structures such as factories and grain elevators. More recently the new architecture, sometimes reflecting features of the European 'international style', sometimes with an attempt at a distinctive Canadian treatment, has been applied to many other types of buildings. Groups of architects are now engaged in community and tn. planning and in industrial design.

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Canada Goose, *Bernicla canadensis*, species of the Anatidae or duck family which is common to N. America. It is a wild goose which sometimes breeds in Europe, and it is closely related to the Barnacle Goose (q.v.).

Canadian Sea, see HUDSON BAY.

Canal (Lat. *canalis*, a channel), artificial water-course serving the purpose of drainage or irrigation, or more frequently for the transportation of merchandise in boats, barges, or ships. Cs. have undoubtedly been in existence since very early times. Herodotus and Strabo both speak of a C. across the isthmus of Suez which was begun in 616 B.C. by Necho and completed by the year 521 B.C. The first use to which Cs. were put was doubtless irrigation, but navigation soon followed. In ant. Egypt, India, and China Cs. undoubtedly existed; in Egypt the Nile has from time immemorial been noted for its extremes, and traces of waterways which the ant. Egyptians constructed still remain. The Imperial or Grand C. of China is of great antiquity; it commences at Hang-chau, near the mouth of the Tsientang-kiang R., and crossing the Yang-tszekiang at Chinkiang, terminates at Tientsin. The total length is about 650 m., but the depth is seldom more than 6 ft. That which did more than any other invention to revolutionise C. traffic was the invention of locks. According to some authorities, the Dutch were the first to make use of locks, according to others the Its. A lock chamber enclosed by a pair of gates was said to have been constructed by two brothers Domenico in 1481, and Leonardo da Vinci six years afterwards completed six locks which united the Cs. of Milan. The Languedoc C., or C. du Midi, may be looked upon as the prototype of modern European Cs. This C. connects the bay of Biscay and the Mediterranean. It has a length of 148 m., and there are 119 locks, which have an average lift of 61 ft. The Cs. of some time ago were only available for barge traffic or boat traffic, but gradually the size increased until, with the growth of commerce and the increase in engineering skill, Cs. have been constructed to take ocean-going ships. A C. must either be constructed all on one level, which is rarely feasible, or the rise and fall of the surrounding country must be adapted in some way. This is done by the construction of a series of level reaches at varying heights above a datum line; each reach is closed by locks. The bases of the hills and the winding of the valleys must provide the general route for these reaches, but at various places it will be found necessary to cross an upward slope by a cutting or a tunnel, or a downward slope by an embankment or an aqueduct. The channel of the C. has a flat bottom and sides which slope outwards from the bottom. In dists. the soil of which is not calculated to withstand the erosion of the water, it is necessary that the sides should be lined with 'puddle.' This is the name given to a compound of tempered clay mixed with water, which is worked into the sides to a distance of 2 or 3 ft. Sometimes the sides are faced with stonework or concrete where there is much traffic, and durability is the main consideration. As regards the water supply for a C., it is, of course, essential that there should be sufficient water to supply the C. through-

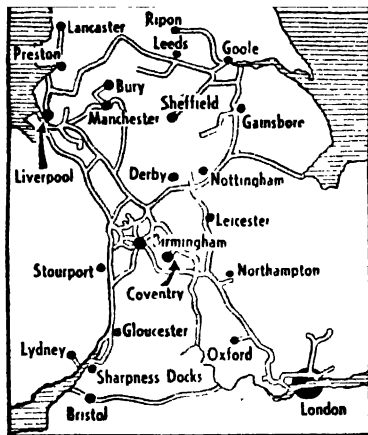
out the year if it is to be a profitable and useful undertaking. If the natural supply cannot be depended upon, reservoirs must be built which will hold sufficient. The situation, catchment area, etc., of such reservoirs will be governed by the same considerations as in reservoirs for drinking water, save that the cleanliness of the water is not so essential. The dimensions of a C. are naturally regulated by the size of the boats which are used thereon. In order that the resistance of the water should be as small as possible, a table of various measurements has been calculated. According to this the breadth of the C. bottom should be at least twice as much as the greatest breadth of the boat using the C.; the depth of the water in feet should be at least one and a half times the draught of the boat; and the area of the waterway should be six times the greatest midship section of the boat. The width of an ordinary inland C. in this country is from 25 to 30 ft. at the bottom, which is flat, and from 40 to 50 ft. at the level of the water. The depth is about 4 or 5 ft., and the angle of slope of the sides varies with the nature of the surrounding soil. A C. must not only be able to supply any deficiencies in the natural water supply, but must also cope with a too abundant quantity; for this purpose a number of waste weirs to discharge surplus water is necessary. If any portion of the bottom or sides of a C. is defective, it is obviously impossible to run off all the water in the C. while repairs are being carried out; the damage must be confined. For this purpose stop-gates are necessary at short intervals. The locks, which are the most general means of transferring boats from one level to another, are chambers made of wood, brickwork, etc., and provided with gates at each end. The lock is of sufficient size to take the largest vessels which use the C.; it is placed at the termination of the lower reach, and rises to a slightly greater height than that of the water in the upper reach. The gates of the lock, which are very strongly made, open against the direction of the current, and are slightly more than half the width of the lock chamber, so that they meet before they form a straight line, and are kept firmly in place by the pressure of the water. Sluices are placed in each gate near the bottom, and can be worked from the top of the lock independently of the gates themselves. When a boat or barge is about to ascend from the lower to a higher reach of the C., the upper gates and sluices, commanding the flow from the upper reach, are closed. The sluices at the lower end of the lock are opened, and when the level of the water in the lock chamber is the same as that of the lower reach, the boat enters the lock. The lower gates and sluices are then closed, whilst the sluices only in the upper gate are opened. The water in the lock then gradually rises until it reaches the level of the upper reach, when the upper gates can be opened and the boat passes out of the lock into the higher reach. When a boat descends from a higher reach to a lower,

the procedure is reversed; the vessel enters the lock when the water is at the higher level and, after the lower gates have been shut and the sluices opened, passes out on the lower reach. In large locks the sluices may be carried through the walls instead of being in the gates. The material of which the gates are composed is generally hardened oak; in small narrow locks a single gate at each end is sufficient. The gates are opened and closed by balance beams projecting over the lock side, which are worked either by gearing or by a hydraulic ram. The locks are not much larger than the vessels they are required to take. The Eng. C. boat is from 70 to 75 ft. long and 7 or 8 ft. wide; a barge is the same length, but double the width, i.e. from 14 to 15 ft. The average lift of a C. lock is from 8 to 9 ft., sometimes as low as $1\frac{1}{2}$ ft. In Belgium, on the Canal du Centre, the locks have a lift of 17 ft., whilst one lock on the Saint-Denis C. has a lift of $32\frac{1}{2}$ ft. When there is a very big difference in the levels of the two reaches of the C., it is sometimes overcome by a flight of locks, in which the lower gates of one lock form the higher gates of the one below it. On many of the Eng. Cs. an inclined plane is placed at the side of the lock for the use of pleasure boats; the boats are placed on the rollers which form the plane, and hauled over by hand. The same principle is sometimes used for barges, but as such a method is liable to strain the timbers, etc., of large vessels, a more common arrangement is for two counterbalancing tanks to be used. Each of the tanks holds sufficient water to float a boat, two lines of rail are used, on which the tanks run, and they are connected by chains running on pulleys in such a way that as one ascends the other descends. Vertical lifts are also employed on some Cs.; they are only used where the difference in the levels of the reaches occurs in a short length of C. to obviate the construction of embankments, etc. At Anderton there is such a lift, which deals with barges of as much as 100 tons burden, and has a lift of 50 ft. The horse is still used for haulage on the smaller Cs. Steam towage was first introduced about the beginning of the nineteenth century, but tugs towing a string of barges are only practicable when there are no locks on the C., or when the locks are so constructed as to take the tug and all the barges at the same time. If the vessels have to be taken through the locks separately, the time which is spent in going through the locks more than counterbalances the time gained on the rest of the journey. Barges having a steam engine of their own are now utilised; on a portion of the Telfow C. in Germany, an electric system of traction was put into use. The speed at which the least expenditure of energy is necessary is the speed of free propagation of the primary wave raised by the motion of the boat. This fact was taken advantage of by the fast passenger barges which used to run on some Cs.; when the wave had attained a fair speed, the boat was jerked forward

and travelled on the top of the wave. By this means a speed of 12 or 15 m.p.h. was attained. The ordinary speed of a horse-drawn C. boat is from 2 to 3 m.p.h.; if an excessive speed is attempted, the wave raised washes away the sides of the C. much more quickly, and the water is disturbed for a long distance along the C.

Canals in the United Kingdom.—Great Britain was one of the last nations to make any use of Cs. The first C. was that connecting Manchester and Worsley, which was proposed by the duke of Bridgewater in 1755. The use for which the C. was designed was the transportation of the coal from the duke's collieries at Worsley to Manchester. The work was successfully accomplished by Brindley, the engineer, who overcame all the difficulties. There are immense embankments on the old C., viaducts, and bridges; two branches went from the Mersey at Runcorn Gap, one going to Manchester, the other to Pennington. The length was 40 m., and the fall 2 ft. in a m.; the waterway was 5 ft. deep and 52 ft. wide. The successful accomplishment of this work encouraged others, and before the introduction of the railways the length of the navigable Cs. in Great Britain was estimated at 3000 m. The largest Cs. in Great Britain are the Caledonian C., the Crinan C., the Forth and Clyde C. in Scotland, and the Gloucester and Berkeley Ship C. (17 m.) in England. Other main Cs. in England and Wales are the Manchester Ship C. (35½ m.), the Grand Union (280 m.), the Birmingham (160 m.), the Leeds and Liverpool (190 m.), the Aire and Calder (90 m.), and the Trent Navigation System (120 m.). The Caledonian C., constructed by Thomas Telford, is remarkable for its locks, which are on a par with those in the Gotha C. at Trollhättan. The length of the C. from its southernmost point at Corpach to its N.E. terminus at Clachnaharry on the shore of Beaulieu Firth is 60 m. The first C. to be modernised in England was the Grand Union, which links London with Nottingham and Birmingham. The work of dredging and deepening was completed in 1934, and the C. can now carry motor-driven barges at greater speed. The Nene R. was also canalised with locks to take ships of 15-ft. beam, and linked with the Grand Union, thus providing a through waterway from the Wash to the Bristol Channel, and, at the same time, joining Birmingham and Manchester with London. There are in all 3641 m. of waterway in England and Wales, 184 m. in Scotland, and 848 m. in Ireland. The total extent of Cs. in use in Great Britain is about 2500 m., of which until 1948 about 1000 m. were railway-owned. In 1948 most of the important inland waterways (2000 m.) in Great Britain were taken over under the Transport Act, 1947, by the Brit. Transport Commission and placed in the charge of the Docks and Inland Waterways Executive and organised into five areas (Northern, North-west, Eastern, Southern, and Western) with headquarters in Leeds, Northwich, Nottingham, Gloucester, and London.

The Bridgewater, Manchester Ship, and Thames Conservancy are not included in these arrangements. The ann. tonnage carried by them is about 15,500,000 tons. The proprietors of Brit. Cs. are common carriers, and governed by such Acts as the Railway and Canal Traffic Acts of 1854 and 1858. These Acts oblige them to provide in a reasonable manner for the needs of the public by settling and publishing rates for carriage and providing facilities for transhipment. If a C. is unnecessary, or if the proprietors leave it in an unfit state for navigation for the period of three years, the Board of Trade may authorise the proprietors to abandon the C., which may then either be abandoned or handed over to other proprietors.



News Chronicle

THE CANAL SYSTEM OF ENGLAND

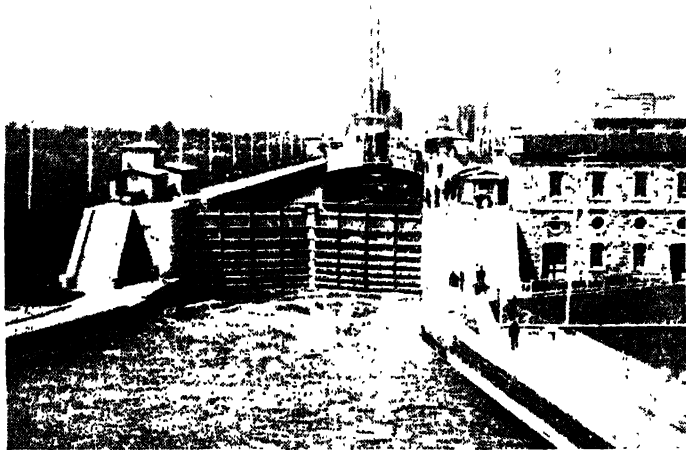
In 1939 10,000 boats had registered and 40,000 people lived on the system. The sanitary condition of C. boats when used as dwellings and the registration of such vessels by the local sanitary authorities are provided for by the Canal Boats Acts of 1877 and 1884. The Ministry of Health appoints inspectors to see that the law is duly carried out; if the provisions of the Canal Boats Acts are not complied with, both masters and owners are liable to fines recoverable on summary conviction. Surviving from the Second World War, and until the nationalisation of Cs., the Central C. Committee advised the minister of transport on the policy governing inland waterways and co-ordinated the work of six regional C. committees, which exist to ensure that the resources of the C. system as a whole are put to the best use. The total tonnage carried on the 873 m. of the Brit. Cs. (Aire and Calder, Birmingham, Bridgewater, Grand Union, Lee and Stort, Leeds and Liverpool, Manchester Ship, Sheffield and S. Yorks, and Trent

Navigation) in 1938 was 18,274,000 tons, as against 20,254,000 tons for 1937. The ann. average tonnage carried by inland water transport during the war years was 11,200,000, a relatively small mileage of waterway in the N. of England accounts for a large proportion of this wartime total tonnage, and, by comparison, the contribution of the whole of the midlands C. network was small. It might therefore seem that the Cs. are a wasting asset, one problem being to formulate a post-war policy. Statements of waterway policy have often appeared during the past half century, but have not been implemented. The C. Association and the Inland Waterways Association have done much to obviate neglect of Brit. waterways. Some Cs. are choked with weeds and mud, rendering navigation impossible; often the lack of adequate dredging, together with leaky locks, greatly delays traffic; there is no uniform system of tolls; each system has its own fees, regulations, and size of lock key; and even those Cs. which are navigable are in need of more attention, such as the removal of weeds and the renovation of banks and sluice machinery—in which the Grand Union C. set an admirable lead.

Continental Canals.—Belgium occupies a foremost place in inland navigation; it had, before the First World War, a length of Cs. amounting to 1360 m., which is 1 m. of waterway to every 84 m. of ter. To-day, the total length of Cs. and navigable rivs. is still over 1000 m. The Albert C., connecting Antwerp and Liège, a distance of some 80 m., was completed just before the outbreak of the Second World War. It can carry barges up to a burden of 2000 tons, and is over 80 ft. wide at its narrowest, with a depth of 16 ft. Work was also carried out to widen and deepen the Charleroi-Brussels C. To the Netherlands, the Princess Juliana Ship C. was opened in 1935, 20 m. in length with a depth of 16 ft. and a width of 50 ft. Another modern C. is the Twente C. from Zutphen to Enschede, opened in 1936. Since the days of the first C. in France, which was constructed between 1605 and 1641, the Fr. have on the whole been keenly alive to the advantages of this method of transport. The second C. ever constructed in France joined the bay of Biscay with the Mediterranean, and was thus the forerunner of the modern ship Cs. It is only 6½ ft. in depth, however, and thus is not adapted for the accommodation of ships of over 100 tons burden. The Fr. Gov., whilst developing the railways of the country, did not overlook the Cs., and there are 6000 m. of navigable waterways with a total traffic of about 40,000,000 tons. Many of these waterways are maintained entirely by the State, and no tolls are levied. The Fr. Gov. in 1879 passed a law to secure uniformity in the dimensions, etc., of the prin. Cs. By the above law all Cs. must have a depth of 6½ ft., locks 126½ ft. by 17 ft., and a space under bridges of 12 ft., thus enabling boats which will enter the locks, of about 300 tons burden, to travel along all the prin. Fr. Cs. Prior to the outbreak of war in

1939, considerable work was carried out in improving the existing waterways and in installing electrical machinery at many of the locks on, for example, the Rhine-Rhône C. and elsewhere. In Germany, between the two world wars, an ambitious scheme was launched for joining, by canal, the Rs. Oder, Elbe, Weser, and Rhine, extending to nearly 7000 m. of C. The last link in this chain was completed in 1938, the Mittel-land C. from Magdeburg through Brunswick and Munster to the Rhine, joining with the Dortmund-Ems C. Russia is another country which greatly developed its inland waterways in

increased, and now the locks are 270 ft. in length, 45 ft. in width, and 14 ft. in depth. A C. at Sault Sainte Marie connects Lake Superior with Lake Huron to avoid riv. rapids. The Chesapeake and Ohio C. was begun in 1828, and by 1850 extended from Georgetown on the Potomac to Cumberland. This C. connects Maryland with Washington, D.C., thus enabling coal to be brought from the Cumberland region to the Potomac R. It is 184 m. long and has 73 locks. The Erie C., which connects Lake Erie with the Hudson R., is 365½ m. in length; the width at the bottom varies from 53 to 79



Canadian Government

LOCKS AT SAULT SAINTE MARIE, ONTARIO

recent years. The Soviet Gov. has aimed at making Moscow an important inland port, linking it with the Volga and thence with the White Sea, the Baltic, the Black Sea, and the Caspian. The Moscow-Volga C. was completed in 1937, giving about 80 m. of navigable waterway, and work was then begun on the Volga-Don C. between Stalingrad and Rostov. It will thus be seen that the continent of Europe is far in advance of Great Britain in the development and use of Cs., but it must be added that the major installations of the C. system in N.W. Europe and in Russia suffered from bombing during the Second World War.

Canals in the U.S.A. and Canada.—In America there are numerous Cs. which connect the separate riv. navigations. The St. Lawrence C. between Lake Ontario and Montreal, and the Welland C. join Lake Erie and Montreal—which last-named is nearly 27 m. long and rises by means of locks to over 320 ft. (see WELLAND). The size of these Cs. has been

ft., that at the surface from 70 to 98 ft., whilst the depth ranges between 7½ to 9½ ft. The Delaware at Phillipsburg and the Hudson R. at Jersey City are connected by the Morris C., which crosses a spur of the Alleghenies by a system of inclines; it is 102 m. in length. The Chesapeake and Delaware C., a part of the toll free Atlantic inland waterway, was taken over by the State in 1919. The Dulles and Celilo C., completed in 1915, allows of riv. navigation up the Columbia and Snake Rs. for nearly 600 m. from the ocean. The ship Cs., generally, of the U.S.A. are of great economic importance, but the same cannot be said of the inland C. system. One fairly recent experiment is the State Barge C., New York, which connects New York city with Buffalo by a deep-water route of 790 m. and has a minimum depth of 12 ft., but it costs the taxpayers of the state \$7,000,000 annually, and only a negligible fraction of the expected traffic passes over it. It was, however, deepened in 1941

to a depth of 14 ft. between the Hudson R. and Lake Ontario. The Cape Cod C., built in 1914, to connect Buzzard's Bay with Massachusetts Bay, was taken over by the State in 1923 to become a toll-free section of the Atlantic inland waterway, and it has since been deepened and widened. Work on the canalisation of the Ohio R. was undertaken to provide a greater depth for the whole 1000-m. length. The Chicago Drainage C., constructed to discharge the Chicago drainage into the Upper Mississippi Valley instead of into Lake Michigan, has now, through the construction of a connecting Illinois waterway, become a link in a waterway from the Great Lakes to the Mississippi.

Ship Canals.—Cs. signed to admit large ocean-going vessels are constructed with one of two purposes. They are either to place inland tns. in communication with the sea, or to shorten the distance by sea between two points by cutting across an isthmus. The Manchester Ship C. and the Amsterdam Ship C. are the best examples of the former class, and a short account may be given of them. The Amsterdam Ship C. serves the peninsula of N. Holland and unites the IJssel Meer (Zuider Zee) with the N. Sea, but its real object was to allow the trade of Amsterdam a more direct outlet, as the N. Holland C. and the IJssel Meer were too shallow. Only a narrow strip of land had to be excavated between Velsen and the N. Sea, as the direct route passed through Lake Y and Wijker Meer. Banks were formed along the C. by the soil which was dredged from the bottom in order to deepen the C., and by this means a considerable extent of ter. was reclaimed from the sea, and so a portion of the cost was realised. The C. is suited for large vessels, having a bottom width of 88 ft., and a width at the water level of 186 ft., and a depth of 23 ft.; it is 16½ m. in length. The level of the C. is kept only 14 m. above low water in the N. Sea in order to maintain the drainage of the reclaimed lands. The inflowing water from these lands and from the branch Cs. is pumped into the IJssel Meer by pumps situated in the dam which shuts off the C. from the IJssel Meer. The entrance channel is protected by two converging concrete breakwaters, and the C. is controlled by locks near each end with gates pointing both ways. The C. was begun in 1865, and finished in 1876, at a cost of about £2,600,000. The Manchester Ship C. was first discussed in 1882, and although it met with opposition in Parliament from the railway interests, the desired Act was obtained and the C. sanctioned in 1885. The three tidal locks of this canal at Eastham have chambers 600 ft. by 80 ft., 350 ft. by 50 ft., and 150 ft. by 30 ft.; the sills of these chambers are respectively 28 ft., 25 ft., and 16 ft. below the normal water level of the C., so that vessels can enter and leave at about half tide. The lift of these locks is 16½ ft. The Manchester Ship C. is the first large ship C. constructed with locks raising vessels 80½ ft. and carrying them inland, so turning an inland city into a port. The time taken to pass through the C. is about

seven hours, including about half an hour for passing through the locks. The swing aqueduct for the Bridgewater C. is one of the most notable features of the C.; it was constructed by Sir E. Leader Williams to replace Brindley's fixed aqueduct. When the aqueduct is closed traffic can pass along the Bridgewater C., but it is opened for the passage of masted vessels along the ship C.; communication between the two Cs. is maintained by a hydraulic lift. The C. was commenced in 1887 and finished in 1894; the cost was estimated at £5,330,000 but in reality came to £15,500,000. (*See also MANCHESTER SHIP CANAL.*) Among other Cs. of this nature may be mentioned the Bruges Ship C., which renders Bruges a seaport; the Ghent-Terneuzen C., which provides an outlet for Ghent by a C. joining the estuary of the Scheldt at Terneuzen, enlarged and deepened in 1870 so that vessels of 1400 to 1700 tons can reach Ghent; and the Leningrad and Kronstadt Ship C., which enables sea-going vessels to reach Leningrad. This C. starts from the Neva and goes S.W. for about 2 m., when it curves and proceeds in a straight line to Kronstadt. It was begun in 1877 and finished in 1884, at a cost of £1,240,000. The first C. which cut across an isthmus to enable ocean-going ships to use a shorter route was the Suez C. This C. connects the Mediterranean with the Red Sea; it is about 100 m. long, and has a depth of 26 ft. The traffic increased so much and the advantages of an increased draught are so evident that the bottom width of the C. was widened to about 230 ft., and the depth made 29½ ft. In 1879 M. de Lesseps, the constructor of the Suez C., brought forward a scheme for connecting the Atlantic and Pacific oceans by a C. across the isthmus of Panama. The route which he proposed for the C. to take was across the narrowest part of the isthmus, between Aspinwall (Colon) and Panama. The C. along this route was begun in 1882. It was to be 47 m. long, and the original intention of de Lesseps had been for the C. to be level throughout, like the Suez C. The increased cost, however, and the difficulty which was experienced in raising funds for the carrying on of the work, were instrumental in de Lesseps's resorting to a locked C. It was to have a width at the bottom of 72 ft., and at the top of 160 ft., and a depth of 27 ft. save through the rock cutting of the Culebra, where the width at the bottom was to be 78 ft. and at the top 92 ft., with a depth of 29½ ft. The scheme fell through, however, and the company became bankrupt; the C. was thereupon acquired by the Amer. Gov. This gov. put the construction of the C. in the hands of the U.S.A. Corps of Engineers, under the leadership of Col. G. W. Goethals. With the whole resources of the U.S. Gov. at his back, Col. Goethals built the C. in about ten years. Of this period about seven years were spent in actual construction, the first three being preparatory. Not only had plant and labour to be assembled and railways constructed, but, most important of all, the dist. had to be made fit for white

men to live in. Yellow fever, the scourge of the country, had to be combated by a ceaseless hygienic warfare on the disease-carrying mosquito. The work was finally completed in 1914, and on Aug. 3 of that year, on the day that Europe was rushing to arms, the first ocean steamer passed through the C. The C. is undoubtedly the most important piece of C. engineering in the world. Its length from shore to shore is a little over 40 m., but the approaches on either side have been dredged for about another 10 m. A vessel coming from the Atlantic travels for nearly 7 m. until it comes to the first locks at Gatun. These are three in number and give a lift of 85 ft. The ship next enters the Gatun lake, which it traverses for nearly 24 m. to Gamboa, where the celebrated Culebra Cut begins. The cut is through a hill, which is much given to 'slides,' and requires constant dredging. After travelling along the cut for 8 m. the vessel reaches the Pedro Miguel lock, where it is lowered in one lock 31 ft. to the small Miraflores lake. At Miraflores tn. there are two locks with a fall of 54 ft. to the sea level of the Pacific, which is reached in another 8 m. Traffic on the canal is continuous, for it is so well lighted and buoyed that it can be operated at night, and all locks are in duplicate so that ships can pass each other even at the locks. The locks are the finest in the world. They are uniform in size, being 1000 ft. long and 110 ft. wide, and the walls and bottom are constructed of concrete. All lock walls are 81 ft. in height, except at Miraflores, where an extra foot has been added because of the extreme Pacific tides. The walls of the locks are on rock foundations. The gates, composed of two leaves, are 65 ft. wide and from 47 to 82 ft. high and of great weight, varying from 380 to 730 tons. In all cases except one there are intermediate gates so that smaller vessels can be worked through more expeditiously. The depth of water on lock sills is 40 ft., and the time required to fill or empty a lock is from 8 to 12 min. A ship takes about an hour to pass the Gatun locks, half an hour at Pedro Miguel, and three-quarters at Miraflores, the passage of the entire canal being made in about 7 hours. (See also PANAMA CANAL.) In very early times it was proposed to build a C. across the isthmus of Corinth, and traces are found of works for such an undertaking begun in the time of the Emperor Nero. The C. was begun in 1882 and finished in 1893, at a cost of between £1,000,000 and £2,000,000. It is 4 m. in length, with a bottom width of 72 ft., and a depth of 26½ ft.; the entrances at each end are protected by solid jetties built out into the sea. The Holstein C. connects the R. Elber by the Baltic near Kiel, but is only 5¼ ft. wide at the bottom, and 9½ ft. deep, being only useful for small vessels. The Baltic Ship C. was therefore built between the Baltic and N. seas, starting from Holtenau near Kiel, where a great lock was constructed, and joining the Elbe at Brunsbüttel. The length of the C. is 60 m., width at the

bottom 85 ft., 190 ft. at the top, and depth 28 ft. The C., which saves the vessels using it a distance of 237 m., was begun in 1887 and finished in 1895, at a cost of about £8,000,000. Other recently opened ship Cs. are the Welland, mentioned above, a Canadian ship C. reconstructed in 1929-30 (see WELLAND), and the Princess Juliana Ship C. in the Netherlands, (see above). See S. Smiles, *Lives of the Engineers*, 1864; R. C. R. Minikin, *River and Canal Engineering*, 1920; H. R. de Salla, *Bradshaw's Guide to the Canals and Navigable Rivers of England and Wales*, 1928; G. Cadbury and S. P. Dobbs, *Canals and Inland Waterways*, 1929; A. Wilson, *The Suez Canal: its Past, Present, and Future*, 1939; L. T. C. Rolt, *Narrow Boat*, 1941; F. Eyre and C. Hadfield, *English Rivers and Canals*, 1945.

Canale, Antonio, called **Canaletto** (1697-1768), Venetian painter, first distinguished himself by painting decorations for theatres. In 1719 he went to Rome to study the works of the old masters; and on his return to Venice painted many views of that city. He paid visits to London in 1746 and 1764, and painted some views of the city. The Louvre has six of his pictures, the National Gallery eleven. See K. T. Parker, *The Drawings of Antonio Canaletto in the Collection of H.M. The King at Windsor Castle*, 1948.

Canalejas y Méndez, José (1854-1912), Span. statesman. b. in Ferrol. Took degree of doctor of law at eighteen. Member of the Cortes at twenty-seven. Became chief of a democratic group that was prominent about time of execution of Ferrer. Prime Minister, Feb. 1910. Shot dead by anarchist in Madrid, Nov. 12, 1912.

Canaletto, see CANALE, ANTONIO.

Canalgre (*Rumex hymenosepalus*), plant of the S. United States. A tanning substance is obtained from the rootstock, which gives a rich orange colour and imparts softness of touch to hard leather.

Canandaigua, vil. and co. seat of Ontario co., New York, U.S.A., 30 m. S.E. of Rochester; manufr. bricks, ploughs, flour, and tin ware; it is the seat of the Ontario Orphan Asylum, Brigham of the S. United States. A tanning substance is obtained from the rootstock, which gives a rich orange colour and imparts softness of touch to hard leather.

Canar, see AZOUGES.

Canara, see KANARA.

Canaris, Constantine, see KANARIS.

Canary Bird, or **Canary Finch** (*Serinus canarius*), passerine bird of the family of Fringillidae or Finches. It is found in large numbers in the Canary Is., Madeira, and the Azores, but has been domesticated in Europe since the sixteenth century, and is one of the most common of cage-birds. In its wild state the plumage is green, sometimes streaked with brown, and resembling that of a linnet or skink, the prevalent yellow of the domestic species being the result of artificial selection for breeding purposes. The artificial selection has also resulted in increasing the average size of the bird,

the domestic variety being from 6 to 8 in. in length, while the wild variety is only from 4 to 5 in. long. The wild C. builds its nest of moss, feathers, and hair, in thick high shrubs or trees, and produces two or four broods in a season, but it breeds readily in confinement, sometimes laying from four to six eggs, pale blue in colour, four times a year. The work of building the nest and of incubation is generally the part of the female, while the cock-bird usually feeds the young. The natural song of the C. is loud and clear, and during the mating season the males seem to compete with one another in the ardour and beauty of their melody. It can be taught various notes, and readily imitates the notes of other birds. Their chief foods are canary and millet seed; groundsel, chickweed, and sugar are appreciated luxuries. Cs. mate readily with siskins, goldfinches, greenfinches, and linnets; the cross-breeding of Cs. is a favourite occupation in the Tyrol. The chief varieties of the domesticated C. are the Norwich, which is the hardest, and of a very rich colour; the Belgian Fancy, the most beautiful and costly; the Lizard, so called from its spotted back; the Cinnamon, so named from its colour; the Yorkshire, a long, thin, closely feathered bird; the Lancashire Cobby, the largest variety, with a crest of feathers on its head; the London Fancy, a little yellow or biscuit-coloured bird with black wings and tail; the Scotch Fancy, a large imposing variety, bred largely in Scotland; and the Roller C., a very small bird, bred chiefly for its unusually beautiful song. There are sev. varieties of finches very closely allied to the C. and often sold as such, but they are generally very inferior as song birds. See F. J. Chatterton, *Canaries and how to keep them*, 1924; C. B. Upton, *The Breeding and Management of Canaries*, 1934.

Canary Islands, thirteen is. in the Atlantic Ocean. They are of volcanic origin, and form a prov. of Spain. The prin. is. are Tenerife, Grand Canary, Palma, Ferro or Hierro, Lanzarote, Gomera, and Fuerteventura; the other six are exceedingly small: Graciosa, Roca, Allegranza, Santa Clara, Inferno, and Lobos. Administratively, they form two provs. of Spain, named Las Palmas (which comprises Grand Canary, Lanzarote, Fuerteventura, and the six small is. mentioned above) and Santa Cruz de Tenerife (which comprises Tenerife, Palma, Gomera, and Hierro). From their position, and their nearness to Africa, the is. probably form a continuation of the great mt. system of N. Africa. They are all of a rugged and mountainous character, the chief peaks being those of El Cumbre in Grand Canary (5812 ft.), and the Peak of Teide in Tenerife (12,182 ft.). They are most healthy, as during the summer and autumn there is hardly any rainfall; the rainy season lasts from Nov. to March. The products of the Cs. are sub-tropical in character. Since the demand for cochineal was temporarily ended by the discovery of

aniline dyes, bananas have been the prin. product of the Cs. Tomatoes and potatoes are also largely exported to England. The pop. is mainly Sp., with an infusion of Guanche blood. The Guanches or aboriginal inhab. were only conquered by the Spaniards after prolonged fighting during many years. In 1402 Jean de Béthencourt, a Norman gentleman, subdued some of the is. in the name of the king of Castile, but it was not until the end of the century that the whole were conquered. In Gomera conversation is still carried on by whistling at a distance of 3 m. or more. The 'blood' of the dragon tails, which is still an article of commerce, was used for preserving the mummies. Columbus called at the Cs. on Sept. 7, 1492, and Capt. Cook slept on shore in 1772. In 1656 Robert Blake attacked Santa Cruz, Tenerife, and sank sixteen galleons, laden with treasure. In 1797 Nelson met with his only defeat there and lost an arm; two of his flags are still to be seen in one of the Santa Cruz churches. Of recent years bananas have filled the is. with new motor cars running on new roads, and even cochineal is in demand for hosiery. Areas about 2808 sq. m., pop. 563,000. See D. A. Bannerman, *The Canary Islands*, 1922.

Canary Wood, timber of two trees of the Canary and Madeira Is., *Persea indica* and *P. canariensis* respectively, belonging to the Lauraceae family.

Canberra, federal cap. of Australia. The Commonwealth has set out to make it one of the most beautiful cities in the world. Parks have been made, roads constructed, and trees planted, and a temporary Parliament House was opened by the duke of York on May 9, 1927, twenty-six years after the opening of the first federal Parliament at Melbourne by his royal father, King George V. It is 2000 ft. above sea level, from which it is distant 75 m. It is 204 m. from Sydney and 429 from Melbourne. The federal Capital Ter., which includes 28 sq. m. at Jervis Bay, is 939 sq. m. in area and includes a cluster of peaks 3000 ft. in height. There are sev. centres for scientific research, the more important being the Australian Institute of Anatomy, the Plant Industry and Entomological laboratories of the Council for Scientific and Industrial Research, the Australian Forestry School, and the Commonwealth Observatory at Mt. Stromlo. Pop. of ter., 15,000.

Cancellieri, Francesco (1751-1826), Fr. historian, b. at Rome. He was made director of printing at the Propaganda in 1802. His literary activities were varied, and included vols. of memoirs, pamphlets, lectures, etc. His works include: *De secretariis veterum christianorum et basilicæ vaticane* (1786); *Bibliothèque pompienne* (1813); *Les Sept Choses fatales de la Rome antique* (1812).

Cancer (Lat. *cancer*, Gk. *καρκινος*), in zoology, a genus of the crustacean order Decapoda (see CRAB); in astronomy, a constellation represented as a sign of the zodiac by a crab; its chief importance

lying in the fact that it denotes the N. limit of the sun's apparent course in the heavens in summer; hence the Tropic of Cancer (see Tropics) is that meridian on the earth's surface marking the northern boundary of the lat. where the sun has at any time an altitude of 90° ; in

cells, and is usually less malignant than other types of C. because the abnormal growth of these cells is strongly resisted by their normal neighbours and by cells of the connective tissue. The diseased cells are consequently either completely enclosed by fibres or their growth is at least



Australian Official Photograph

FEDERAL PARLIAMENT HOUSE, CANBERRA

The building to the right is west block, which accommodates several government departments. Among the trees in the background is the U.S. embassy.

pathology, any malignant growth, but specifically applied to growths of two types, the carcinoma and the endothelioma.

A C. consists of a *stroma*, or framework of connective tissue surrounding nests of cells which have undergone a particular form of degeneration. In the carcinoma, these cells are of an epithelial type, that is, similar to those cells which form the outer skin lining of all canals which have communication with the external air. Epithelial cells differ in nature according to their function, which may be merely protective, or secretory or glandular, and such Cs. may be classified according to the structure and nature of the cells which compose them. An epithelioma, for instance, is a carcinoma of the squamous epithelium covering the skin and lining the mouth and oesophagus. In the sarcoma the cells which have degenerated are simpler ones of the type found in connective tissue. Such cells are capable of more active growth, particularly in young people, so that the sarcoma is more malignant in the young than in the old. Sarcomata also are subdivided according to the type of tissue they attack, e.g. an osteosarcoma occurs in bone, an adenocarcinoma in glandular tissue. The endothelioma consists of nests of endothelial

cells, and is usually less malignant than other types of C. because the abnormal growth of these cells is strongly resisted by their normal neighbours and by cells of the connective tissue. The diseased cells are consequently either completely enclosed by fibres or their growth is at least considerably hindered. When normal development of an individual takes place, the cells grow and divide, and become specialised for certain work, that is, they become differentiated. In C., these differentiated cells degenerate, returning almost, but not quite, to their primitive condition, and in so doing they regain some of their primitive capabilities. They resemble embryonic cells in their power of extensive multiplication, but differ from them in retaining some semblance of their differentiated form; e.g. a C. of the liver contains cells which have the form, and may actually retain some of the secretory activity, of normal liver cells, and even though such a C. may migrate to another part of the body, such as the eye, or even to bones, and continue its growth, the tissue in which it was originally formed can be detected by examination of the cancerous cells. It is this power of migrating and forming secondary growths (metastases) in other parts of the body which forms one of the chief distinctions between C. and other tumours. Arising at first as a minute area—perhaps only as a single cell—the C. spreads centrifugally by cell growth and division. The growth obstructs the tissues in which it arises and eventually pushes against connective

tissue which endeavours to resist its growth and sometimes encloses it. The C. takes the path of least resistance, and the cells increase rapidly through the lymph spaces. Different varieties of C. differ in their rate of growth; in general it may be said that soft Cs. show the greater activity. The symptoms in the early stages of a growth are not usually very reliable. If the location be internal it may develop painlessly until either its great size interferes with the proper functioning of some organ, or the breaking down of the growth produces dangerous hæmorrhage. General weakness usually accompanies the formation of an internal C., and there is a more definite symptom in the yellowish pallor which is to some extent characteristic. The decrease in vitality in old age, and the cell degeneration that normally occurs in senescence, may partly account for the majority of cases of C. being found in the old, though it should be noted that C. formation is due to *abnormal* degeneration. On the other hand, though C. is rarely found in young people, when it does occur, it is usually more malignant in character than in the aged. An external growth occurring on the breast, lip, or tongue should be promptly examined by a medical man, and it is not too much to say that any abnormal swelling should be attended to without delay, as the surgeon's only hope is early operation. C. of the rectum should also be suspected in cases of 'piles.' The need for a certain amount of care in this matter should not occasion alarm; because although on the one hand the indefinite nature of the early symptoms and medical lack of knowledge of the nature of cancer has caused its name to be universally dreaded, it must not be forgotten that the chances are enormously in favour of any slight manifestation ultimately being traced to a much less serious condition. Truly scientific prevention and cure of C. cannot be carried out until our knowledge of the causes of the disease is much more definite.

The truth is that we do not know what is wrong with the cancer cell. It has been found that certain things may cause C. and other things may cure it, but the inner mechanism of the normal cell and cancer cell are alike dark to us. All that can be said is that a great deal of research has elicited a few fundamental facts about the cancer cell. First, and perhaps most important, is the discovery of Roux, that C. is not inherent in the cell as a whole, but that the juice of certain growths from which all cells had been filtered can transmit the disease. Barnard and Gye, and later Gye alone, showed that the filtered juice contained exceedingly minute particles which transmit such diseases as rabies, influenza, and foot-and-mouth disease; but yet C. could not be an ordinary virus disease for it arose, as it were, spontaneously, and without any of the circumstances of contagion. The most general method of treatment is that of excision, and the operation is usually successful if the C. has not developed too extensively, and particularly if there are

no metastases. Although surgery still remains the best method of treating C., good results have also been obtained in suitable cases with X-rays and with radium. Combinations of the three methods can also be used, *e.g.* following removal of the C., X-rays can be applied to prevent a recurrence. Radium can be applied externally, or internally in radium needles, or as 'seeds' containing radium gas. C. of the prostate gland has been treated recently with injections of stilboestrol, a synthetic hormone. All other kinds of treatment are worse than useless, and none of the so-called 'cures' of quacks will stand the test of investigation. Sixty or more years ago a permanent cure was an extreme rarity: to-day some 35 per cent. of all C. patients could be cured by modern resources of radium, X-rays, and surgery, if they would but seek skilled advice on the first sign of trouble. In actual fact over 70 per cent. of C. patients, when they are first seen by the doctor, are untreatable, and probably less than 5 per cent. are restored to health. When cure is impossible or hopeless, the treatment aims at alleviating pain; and sometimes operation is resorted to with no further end in view than temporarily to relieve the patient.

The cause of C. is still unknown. It is probable that many different causes may operate, and good work has been done in investigating probable causes by researches conducted under the auspices of the Imperial Cancer Research Fund. The able administration of this fund and the unselfish co-operation of medical men and scientists throughout the empire has led to the accumulation of a body of statistical and experimental knowledge, which, though it has had no very definite results, has put the inquiry on a proper footing. Many investigations have been conducted with a view to finding a specific micro-organism for C., but without satisfactory results. None of the claims made to have isolated a C. bacillus have been estab.; but a new direction to the study of C. has been given by the discovery that the disease may be produced experimentally by the application to animals of synthetic chemical compounds of known molecular structure. The arguments appear to be rather against a bacterial origin, for no real evidence of infection has been produced, and it is somewhat difficult to understand how the hypothetical organism picks out widely separated groups of cells in the same individual and leaves unaffected cells with no greater apparent protection. Cases are quoted too, which appear to show that an embryo escapes the disease although the uterus may be diseased, and on the other hand, a child may be born from a healthy womb with C. developed at an early period in its foetal life. The effect of irritation in the formation of cancerous growths has been widely discussed. There is no doubt that irritation is often at least a predisposing cause, and chimney-sweeps' C., to which sweeps at one time were peculiarly liable, was caused by the irritating effect of soot,

as was first noticed in 1775 by an Eng. doctor, Percival Pott. The active carcinogenic principle of coal tar has never been isolated as benzopyrene; other similar substances are also being investigated. The chewing of betel-nut and the eating of hot rice in China have been shown to be associated with cancerous growths. Irritation may also be produced within the body by chemical means, e.g. alcohol is known to promote the degeneration of cells, and arsenic to stimulate their activity. Over-exposure to X-rays or to ultra-violet rays, or to radium causes the rapid and premature degeneration of cells and the formation of C. There is probably a personal factor in all cases, so that some people would be less likely than others to get the disease, and it is at least possible that there is sometimes a psychological cause. Statistics have been collected for the purpose of tracing any possible connection between certain varieties of diet and C., and although statements have been made about fish-eating people and rice-eaters as being peculiarly liable, they probably do not represent a substantial part of the truth. The disease seems to be more common in civilised than in uncivilised communities; this may be due to the fact that civilisation favours the prolongation of life and the preservation of the physically unfit and also provides a very special environment. Moreover, many more cases are diagnosed and recorded as C. in civilised communities than in savage races. Civilisation has effected great changes in the habits of people, particularly with regard to feeding and reproduction, and this is significant in view of the reported comparatively high rate of incidence of C. in the digestive and reproductive organs amongst civilised nations, compared with the relative freedom of less civilised peoples from this disease.

With regard to the question of heredity, more satisfactory information has been obtained through long extended experiments with many generations of mice; and it has been estab. that mice with a cancerous ancestry are more liable to C. than those born from a healthy line. Such a strain of mice showing a hereditary tendency to develop, for instance, a mammary C. can only be maintained by constant in-breeding such as would never occur in humans. It is only when information is gathered upon the comprehensive scale adopted by the Imperial Research Fund committees that reliable statistics can be obtained. Those at present available show that, as in mice, C. in man is rarely directly inherited. People who lead a normal healthy life, fully occupied but free from strain, using all the organs of the body reasonably, are less liable to develop C. than those who are under-nourished, or who live in a highly artificial environment. With the possible exception of C. of the lung, there is no conclusive evidence that C. is increasing in frequency in individuals of any one age-group; it is however diagnosed more often than formerly, and therefore appears to be more common. People live

longer nowadays and hence more of them die from C., which is essentially a disease of middle and old age. See W. B. Bell, *Some Aspects of the Cancer Problem*, 1930; J. Cope, *Cancer: Civilization, Degeneration*, 1932; B. Fischer-Wasels, *Die Vererbung der Krebskrankheit*, 1935; W. S. Handley, *The Prevention of Cancer*, 1936; E. L. Hoffman, *Cancer and Diet*, 1937.

Cancer, name of a genus of decapod crustaceans to which belongs *C. pagurus*, the edible crab. The species live in pairs in holes of rocks. See CRAB.

Cancer, or **The Crab**, fourth of the twelve constellations of the zodiac, denoted by the sign ♋, and marking the limit of the sun's course northward in summer. It contains a large, loose cluster of stars known as Praesepe, the Beehive, which appears as a nebula to the naked eye, and Xi Canceri, a triple star whose two close stars revolve about each other in a period of sixty years, and a third which revolves about the other two, in the opposite direction, in seventeen and a half years. The latter has an irregular motion, which leads to the supposition that it is the satellite of a close, invisible body which itself revolves around the other two stars.

Cancer-root, see BEECHDROPS.

Cancer, Tropic of, that meridian on the earth's surface marking the N. boundary of the lat. where the sun has at any time an altitude of 90°.

Cancionero, Sp. (and Portuguese *Cancioneiro*) word used to describe a collection of early lyrical poems, especially such a collection as was made by the poetic guilds which flourished in the Middle Ages. The oldest is that of John Alfonso de Baena, a converted Jew, who was secretary to John II. Its poems belong to the fourteenth and fifteenth centuries. A later C., attributed to Lopez de Stunica) Zúñiga, contains songs by poets who accompanied Alfonso V. of Aragon to Naples, and afterwards in his imprisonment at Milan. The first *Cancionero General* (pub. in 1511) was that of Juan de Fernández embracing lyrics by over a hundred writers, the earliest of whom is the marquess of Santillana. The earliest of the Portuguese collections is that of King Diniz (1279-1325); the best known is Garcia de Resende's *Cancionero Geral*, 1516. These books of poems are important, because of the flood of light they throw on contemporary manners and ideals. The word C. has also been used to describe a series of poems by different authors, which deal, however, with the same subject. See Vollmüller, *Les Cancioneros et Romanceros Espagnols*, 1909.

Cancroma, see BOATRILL.

Candaba, tn. in ts. of Luzon in the Philippines, on the Panayanga, some 20 m. from Bacolor. Has textile industries and good fisheries near Candaba Lake. Pop. 15,000.

Candace, queen of the Ethiopians at Meroë. She was defeated by the Rom. governor, Petronius, when in 22 A.D. she made an incursion into Egypt, and was obliged to recognise Augustus as emperor.

Candahar, see KANDAHAR.

Candeish, see **KHANDEISH**.

Candela, com. in the prov., and 22 m. S. of the cn., of Foggia in Apulia, Italy. Pop. 9000.

Candelabrum (Lat. *candela*, a candle), large candlestick, and also a lampstand. Candelabra were used by the Romans for domestic purposes and also in sacred rites. They were generally made according to one design, with a base formed of three or more feet of some animal, the shaft branching off into arms which ended in spikes for candles or in flat disks from which lamps could be suspended. Specimens have been found in Pompeii, Herculaneum, and Etruria. Some are beautifully wrought in various metals; others are more massive and are carved in marble.

Candia, largest city in the is. of Crete; a name once given to the whole of the is. It is situated to the N. of Mt. Ida, almost in the centre of the N. coast. The city once was in the possession of the Venetians, from whom the Turks captured it in 1669 after a siege of twenty-four years. Hostilities between the Moslem and Christian inhab. have been frequent. In 1897 Greece became involved in a war with Turkey on behalf of the Christian residents of the is., when for nearly a year C. was under blockade. The tn. is very picturesque with its bazaars and mosques and old Venetian fortifications. There are numerous exports, including soap, oil, dried raisins, and almonds; steamers run regularly to Constantinople, Athens, Smyrna, etc. C. is now officially called Hieraklion, being on the site of the port of the anc. Cnossus, the marvellous city of Minos where fighting bulls slew captive youths and maidens. Pop. 39,000. See **CROSSUS**.

Candidate (Lat. *candidatus*, white-robed, because Rom. candidates wore white), term applied to any one who takes steps towards fulfilling his aspirations for any office, post, or honour, and especially one who is willing to stand in a parl. election. Technically there is no legal decision as to when the aspirant becomes a C. Thus he is popularly recognised as such the instant he enters on an active campaign for the promotion of his object, whilst certain judges regard the appointment of the election agent as the definite sanction of his candidature. The Corrupt and Illegal Practices Prevention Act, 1883, gives the following definition of a parl. C.: 'Any person elected to serve in parliament, and any person who is nominated as a C., or is declared by himself or others to be a C. on or after the day of issue of the writ, or after the dissolution or vacancy in consequence of which such a writ has been issued.'

Candle, source of artificial light. Cs. are usually cylindrical in shape and are made of wax, tallow, or of some other solid fatty material, enveloping a wick of cotton, flax, or linen thread. Until the middle of the eighteenth century, wax and tallow were the only materials employed in the manuf. of Cs., but now they are made of spermaceti, paraffin, palm and coco-nut oils, and stearin. The methods

of manuf. vary according to the material used. They are either dipped, moulded, or rolled. (1) Dipped Cs. are made as follows: A number of wicks of a suitable length are suspended from a frame, so that the distance between each wick is equal to about double the intended diameter of the Cs. to be made. The wicks are dipped in turn into a trough of melted tallow. This operation is repeated again and again, the tallow being allowed to cool before a second immersion, until finally the required thickness is obtained. The outside edge is then smoothed and polished by machinery. (2) Cs. of spermaceti, stearin, and paraffin are usually moulded. For moulding Cs. a frame, holding together a great number of well-polished metal tubes, is used. Through the centre of each tube the wick is securely fixed; all the tubes are connected with a trough, so that when the melted material is poured into the trough, the tubes are filled simultaneously. The Cs. are left in the tubes to set hard. Moulding is now the most usual method of manufacturing Cs., as the whole process of pouring in and removing superfluous melted fat can be accomplished by machinery, and as many as five hundred Cs. can be moulded at one time. (3) Wax cannot be moulded, because in cooling it contracts to a great extent and sticks to the mould. Wax Cs. are, therefore, basted and rolled. The wick is first dipped into melted wax, until a sufficient quantity has thickened round it; then the C. is well rolled between two flat pieces of smooth wood, before the wax has set. Formerly, wicks were made out of the pith of a rush, and later of cotton fibres. The imperfectly consumed portion of the wick had to be removed from time to time by snuffers, an instrument resembling a pair of scissors with a small box attached into which the wick-ends fell. In 1825 Cambacères invented the plated wick, which, when sufficiently burnt, mechanically falls outside the flame, and, by contact with the oxygen of the air, becomes completely consumed. Wicks are now always manufactured so that they are self-consuming and leave practically no ash. Tapers are made much longer than Cs. They have a thick, loosely twisted wick, thinly covered with wax. Night-lights, on the other hand, are very short and thick, their object being to burn slowly and dimly for a long time. Self-draining Cs. are also made, with three or more small pipes the whole length near the wicks. The usual standard of candle-power, or the illuminating power of a candle, taken as the unit for estimating the quality of any other illuminating agent, is a sperm candle burning 120 grains an hour.

Candleberry, see **BAYBERRY**.

Candle-fish, or **Oulachan** (*Thaleichthys*), name of a genus of malacopterygious fishes of the family Salmonide; it is closely allied to the smelt. It inhabits the Pacific coast of N. America and contains so much oil—more perhaps than any other animal—that it will burn like a candle.

Candlemas, feast of the Purification of

the Virgin Mary, celebrated by Rom. Catholics on Feb. 2. The festival gets its name from the fact that on that day there is a procession of candles, and those candles which will be required in divine service for the ensuing year are consecrated. The festival is also observed by the Church of England and by the Armenian Church. It has been compared with the Rom. festival held in honour of Februa, mother of Mars, when candles were burnt; possibly the old custom was utilised by the Church and turned into a Christian ceremony. In Scotland C. Day is the first of the quarterly terms, when interest, taxes, rent, etc., must be paid. The state of the weather at this time is said to determine that of the year.

If Candlemas is fair and clear,
There 'll be two winters in the year.

See also J. Brand, *Observations on Popular Antiquities*, 1849, and L. Duchesne, *Christian Worship*, 1903. G. L. Apperson's *English Proverbs and Proverbial Phrases* (1929) has three columns of proverbial sayings relating to Candlemas Day.

Candlenut (*Aleurites triloba*), tropical species of Euphorbiaceæ which is grown on account of the oil and the dyeing properties contained in the nut. The flowers are large and white, and the fruit is the size of a walnut.

Candlish, Robert Smith (1806-73), Scottish preacher, graduated at Glasgow Univ. in 1823, and after three years' study in divinity, accepted a tutorship to a Scottish boy at Eton. His appointment to St. George's, Edinburgh, at once brought him into prominence. After his first speech in the Assembly in 1839, he came to the forefront of those who later constituted the Free Church, and the part that he played in securing the Disruption was second only to that of his friend and leader, Dr. Chalmers. Moderator of the Assembly in 1861, he accepted the principalship of New College, Edinburgh, in the following year. C. worked unceasingly to secure the union of the various dissenting Presbyterian sects, and the speedy advancement of public education.

Candolle, Augustin Pyramus (1778-1841), Swiss botanist, b. at Geneva, of an ancient, noble Provençal family. He came to Paris in 1797 for the purposes of study, and pub. (1802) *Astragalogia*. Two years later he obtained his doctor's degree for a thesis, *Essai sur les propriétés Médicales des plantes comparées avec leurs formes extérieures et leur classification naturelle*. His system of natural classification of plants, which was opposed to that of Linnaeus, introduced him to Cuvier and Lamarck. Both prompted him to undertake the pub. of the *Flore française* (1803-15). He began to lecture in the Collège de France in the same year, and in 1806 pub. four vols. of the *Flore française*, followed by six vols. in 1815. The Fr. Gov. employed him to carry on research work in botany and agriculture in France and Italy during the years 1806-12.

He was appointed to the professorship of botany at Montpellier Univ. (1810-16), and held the same chair at Geneva (1816-1841). C.'s most important work was *Regni Vegetabilis Systema Naturale* (2 vols., 1818-21), which was reissued under another name as *Prodromus Systematis Naturalis Regni Vegetabilis* (17 vols., 1824-73), to which he did not contribute more than the first seven vols. His valuable herbarium was bequeathed to his son, Alphonse Louis. See his *Mémoires et souvenirs* (ed. by his son in 1862) and W. de la Rive's *De Candolle*, 1851.

Candon, city in the Ilocos Sur prov., near the W. coast of the Is. of Luzon in the Philippines. Has cotton factories. Pop. 20,000.

Candy, see KANDY.



CANDYTUFT

Candytuft (*Iberis*) genus of Cruciferae which flourishes in Europe and Asia. It is noted for the peculiar corymbs of flowers, in which the outer petals are of greater length than the others and give it a more showy appearance. The species are often cultivated in Brit. gardens as herbs or small shrubs, annuals, or perennials. *I. amara* grows wild in Britain and receives the various names of wild, or bitter, C., clown's mustard, and scitica cross; the term C. itself is said to have been derived from Candia in Crete. *I. alpina* and *I. Gibraltaria* betray their habitats by their specific names; *I. semperflorens* and *I. sempervirens* are the broad-leaved and evergreen C. respectively.

Cane, name applied to sev. plants, but most properly to those belonging to the genus of palms known as *Calamus* from which rattan canes are made. The stems of these plants are thin and reedy, and they are used in bottoming chairs, in making ropes and baskets. The rattan C. which is used as a walking-stick is the thick stem of *Calamus Scipionum*. All the plants which yield rattan come from tropical regions of Asia, Africa, and

Australia. The sugar C. is really a grass which is cultivated in the tropics for the sweet juice it contains; its botanical name is *Saccharum officinarum*. The Cs. which are employed in making fishing-rods are the plant stems of the large grass, *Arundo Donax*.

Canea, or Khania, cap. and chief commercial tn. of Crete, situated on the N.W. coast, 70 m. from Candia. The tn. was built on the anct. site of Cydonia by the Venetians, whose colonists settled here in A.D. 1252. The tn. was captured by the Turks after a two years' siege in 1646, or two years before the capture of Candia. There is a fine, though somewhat shallow, harbour, and an export trade in soap, oil, and leather. Pop. 27,000; prov., 112,000.

Canella, small genus of Canellaceæ, occurs on the coast of the W. Indies, especially of Jamaica, and on the mainland of S. America. *C. alba* yields the C. bark which is used as a tonic and stimulant. The bark is freed from its outer rind, is white in colour, and smells like cinnamon, whence it is also called white cinnamon.

Canelli, com. in the prov. of Alessandria, Piedmont, Italy, 13 m. S.E. of Asti. Pop. 8000.

Canelones, or **Guadalupe,** cap. of the dept. of C. in the S. of Uruguay, 24 m. N. of Montevideo. Pop. 4000.

Canes Venatici, 'Hunting Dogs,' a small constellation, added by Hevelius in 1690. They are close behind Ursa Major, and near Bo-tes and Coma Berenices. The chief stars are Cor Caroli, so named by Halley after Charles II., which is a double star of magnitudes three and six; a spiral nebula, discovered by Lord Rosse, 1845; and a cluster of 900 stars of the eleventh magnitude.

Cañete, Manuel (1822-91), Sp. writer. He was for many years Spain's prin. dramatic critic, and strove to raise the standard of the drama of his country. He also did much to make known the hist. of dramatic art in Spain, and to popularise the works of its dramatists. Among his works are: *Un Rebato en Granada* (1845); *El Duque de Alba* (1845); and lyrics, odes, and letters.

Caneva, Carlo (1845-1922), It. general, b. at Tarcento (Venezia). Entered army 1866. Served in Abyssinian campaign of 1897; lieutenant-general 1902. He commanded the troops embarked for Tripoli at the end of Sept. 1911. The conquest of the coast tns. was all that he could accomplish, his forces being insufficient. Much cruelty was alleged against them. He was recalled in Sept. 1912, and was not prominent again until he presided over the commission that inquired into the great disaster to the It. forces at Caporetto (q.v.), Oct. 1917.

Canfield, Dorothy, Amer. author, b. at Laurence, Kansas, Feb. 17, 1879; educated in U.S.A. and Paris, finally graduating at Ohio Univ., where her father was president. In 1907 she married John Redwood Fisher, and settled on a farm near Arlington, Vermont, where most of

her life has been spent, except for intervals of travel in Europe and three years of relief work in France during the First World War. From 1921 to 1923 she was the first woman member of the Board of Education in Vermont, and later (1938) became president of the Amer. Adult Education Association. Her writings on educational subjects have been both numerous and influential, but represent only one part of her literary work, which covers novels, short stories, plays, literary criticism, and miscellaneous writing. Her translation of Giovanni Papini's *Life of Christ* became a best-seller in 1923. Her knowledge of Europe and of European languages is considerable. Among her novels, which are for the most part studies of the problems of middle-class married life, may be mentioned *The Bent Twig* (1915); *The Brimming Cup* (1921); *The Deepening Stream* (1930); and *Seasoned Timber* (1939).

Cang, Cangue, or Kea, instrument of punishment used in China. It is a ring or heavy wooden yoke, the weight of which varies according to the nature of the culprit's offence. The man's head and shoulders are fastened into this cage so that he is unable to lie down or feed himself. On the C. is inscribed his name, the nature of his offence, and the duration of his punishment. He is paraded through the streets, and finally left in some open thoroughfare, or at the city gates, till his sentence has expired, which may last for some weeks or even months.

Cangas de Onís, tn. of N. Spain, in the prov. of Oviedo; of considerable historic interest, and has in its environs numerous remains of Rom. occupation. The abbey of Covadonga is in its neighbourhood. The cave of Covadonga, among the inaccessible mts. of Asturias, was the legendary place of refuge of Pelayo, a member of the Visigothic royal family, who rallied his followers there against the Arabs. Pop. 10,000.

Cangas de Tineo, tn. of N. Spain in the prov. of Oviedo, engaged in farming, leather, cloth, and pottery industries and in copper mining. Pop. 24,000.

Cange, Charles Dufresno, Sieur du, see DU CANGE.

Cango, dist. of S. Africa, about 20 m. N. of Oudthoorn. It is famous for its magnificent caves, where some of the finest stalactites in the world are to be seen.

Canicatti, tn. on the Naro in Sicily, in the neighbourhood of famous sulphur mines. Pop. 32,000.

Canicular Days (*Dies Caniculares*), see DOG-DAYS.

Canidæ, the dog family, which includes wolves, foxes, jackals, etc., constitutes the group Cynoidea of the Carnivora, and is placed between the cats and the bears. Huxley divided the species into two series, the Thooiid, or wolf-like (such as *Canis lupus*, *C. aureus*, etc.), and the Alopecoid, or fox-like (containing *C. argentatus*, *C. vulpes*, etc.), but different zoologists favour various divs. All the members of the family are carnivorous, but some will eat vegetables and insects as well. They

are cosmopolitan and nearly always hunt in packs; they are found abundantly in fossil state with many extinct species. The number of teeth varies in the genera, but the commonest form is that with forty-two—three incisors, one canine, and four premolars on each side of the upper and lower jaw, with two or three molars on each side of the upper, three on the lower jaw. The origin of the domestic dog, *C. familiaris*, is unknown, and wild dogs abound in S. America, among them *C. Cancrivorous*, the crab-eating dog, *C. vulpes* is the common fox, *C. lagopus* the Arctic fox, *C. dingo* the dingo, *C. lupus* the wolf, *C. aureus* the jackal, *C. latrans* the prairie wolf; *Icticyon*

Canis Minor, constellation of the S. hemisphere, N. of C. Major. Its prin. star, Procyon, lies on the line between Sirius and Pollux.

Canister Shot, see CASE SHOT.

Canitz, Friedrich Rudolf Ludwig, Freiherr von (1854-99), Ger. poet, b. in Berlin. He was gentleman of the bedchamber to the elector Frederick William, councillor of state under Frederick I. and Leopold I, created him a baron of the empire. He wrote many satirical poems in the style of Boileau, with odes, hymns, and other poems. His *Poetical Recreations* were popular in his time.

Canker, name of a plant disease which attacks fruit trees, such as the apple and



CRAB-EATING DOG

venaticus is the bush-dog; *Otocyon megalotis* is a solitary African species; *Lycan pictus* is the Cape hunting-dog.

Canigou, The, mt. of France, at the extremity of one of the lateral chains of the oriental Pyrenees. It is of granite formation and is clothed with vegetation almost to its summit, the orange, vine, chestnut, potatoes, fir, birch, rhododendron, and juniper flourishing at their respective altitudes. Its anct. manganese mines are still worked.

Canina, Luigi (1795-1856). It. architect and archaeologist, b. at Casale in Piedmont. He was prof. of architecture at Turin, then he went to Rome, where he spent many years studying its anct. buildings. The results of this work are embodied in *L'Architettura antica descritta e dimostrata coi monumenti*, and in a topographical plan of old Rome. He also directed the excavations of Tusculum, Veii, and the Applan Way.

Canis Major, or *Orion's Dog*, constellation of the S. hemisphere, below Orion. Its chief star is Sirius, by which the constellation may easily be found, this star being on the extension of the line through Orion's belt.

sometimes forest trees, as the larch. It may usually be found to be present when the bark begins to split, or when the ripe fungus protrudes from the wounded bark. Many varieties of low plants may cause the disease, but the ones to which most importance is attached are the fungi *Dasyphypha calycina*, causing larch C., and *Nectria galligena* (not *N. difissima* as was formerly supposed), producing C. of apple and pear. The best methods of curing the tree of C. are to cut off the diseased branches or to cut out the affected parts, and to smear over the wound with an impermeable substance. Some varieties of apples, e.g. Bramley's Seedling and Newton Wonder, are much more resistant than others such as Cox's Orange Pippin; resistance also varies with the dist. and the type of soil.

Canmore, Malcolm, see MALCOLM III.

Cannabis sativa, hemp-plant, forms a genus of Moraceae, or, according to some botanists, of a smaller family Cannabinaceae. It is a native of Central Asia, and is cultivated both for the fibre known as hemp which it produces and for the drug it contains. The hemp is made

from the tough bast-fibres, and is used for making ropes and in weaving; from the resin it exudes hashish is made in the E., and bang from the mature leaves, together with the resin they contain. The flowers are dioecious (i.e. staminate and pistillate flowers occur on different plants) and resemble those of their near relative *Humulus lupulus*, the hop.

Cannaceæ, monocotyledonous family of plants which is frequently united by botanists to **Marantaceæ**. It contains a single genus of plants, all of which are tropical or subtropical. *Canna indica* (Indian shot) is a handsome ornamental plant often cultivated on account of its appearance. The inflorescence is terminal, the flowers are hermaphrodite, asymmetric, and epigynous, with three free sepals and three united petals; the fruit is a capsule. The androecium is represented by a number of petaloid bodies in which the posterior stamen of the inner whorl bears a bilocular anther on its edge; of the petaloid structures, the *staminodia*, one is larger, turns back on itself, and is known as the *labellum*. The gynoecium is inferior and consists of three carpels which are trilocular, have a petaloid style, and contain numerous ovules. Nearly all the species of *Canna* have a great deal of starch in their rhizomes, and arrowroot is made from *C. edulis*. This plant has large, tuberous roots, smooth leaves, and stems coloured at the base.

Cannæ, anct. city of Apulia in S. Italy, near the mouth of the Aufidus (now Ofanto). The tn. is celebrated for the great battle in Rom. hist. when Hannibal inflicted a crushing defeat on the Rom. army, led by the consuls *Æmilius Paulus* and *Terentius Varro*, 216 B.C.

Cannan, Gilbert (b. 1884), Eng. novelist and playwright, b. in Manchester. He was called to the Bar in 1908 after graduating at Cambridge Univ., also worked as dramatic critic. His first novel, *Peter Homunculus*, was pub. in 1909, and was followed by a number of other novels, including *Young Karnest* (1915), *Three Pretty Men* (1916), and *The Shuco House* (1917), which estab. his reputation as a writer of the realistic and psychoanalytic school. His plays include *Miles Dixon* (1910); *James and John* (1911); *Mary's Wedding* (1912); *The Perfect Widow* (1912); *Wedding Presents* (1912); and *The Harbour of Refuge* (1913). He has also written books and essays on social and literary subjects, and was the translator of Romain Rolland's *Jean Christophe* in 4 vols., 1910-13.

Cannanore, seaport and one-time military station of the Malabar dist., Madras, India; came into Brit. possession in 1791; exports pepper, timber, grain, and coconuts. Pop. 27,700.

Cannel Coal, coal containing an unusual amount of ash and volatile ingredients, and burning with a clear, candle-like flame. Valuable as a source of gas and oil. Occurs in Eng. coalfields.

Cannes, watering place of the Riviera,

in the dept. of Alpes-Maritimes, France. The tn. is pleasantly situated on the gulf of La Napoule, and is famed for its climate. Among the interesting features of the tn. are the watch-tower of a medieval castle, built by Abbot Adelbert in 1070; the bridge called *Pont-de-Rion*; a museum of antiquities; and the Albany Memorial church of St. George of England, visited by Queen Victoria in 1887. The tn. was founded by the Romans on the *Via Aurella*, and has suffered repeatedly from bombardment. Lord Brougham, to whom a statue is erected on the prin. promenade, the *Allée de la Liberté*, lived at C. and founded its reputation as a winter resort. There are many orange orchards and flower plantations, which form the chief industries; there is also trade in soap, olive oil, and salted fish. A conference was held here Jan. 6-14, 1922, respecting the Ger. reparation payments. See **CANNES CONFERENCE**. Pop. 45,500, a great number of whom speak It.

Cannes Conference, held by the Supreme War Council on Jan. 6 to 13, 1922, for the purpose of framing resolutions which were to be the basis of a further conference at Genoa on March 8, 1922. Mr. Lloyd George submitted the following resolution which was accepted in principle: (i.) That all Prime Ministers of European powers should attend an Economic and Financial Conference at which a united effort should be made to stimulate European trade as a means of relieving the widespread suffering of European peoples. (ii.) That the allied powers consider that the fundamental conditions upon which alone this object can be effected are that each nation must be free to regulate its own system of ownership, internal economy, and government, and that foreign investors must be guaranteed that their dealings will be respected. The conference also dealt with finance and currency, subversive propaganda and aggression against neighbours. The trifling extent to which these laudable principles have since been applied may be gauged by the failure ten years later of the World Economic Conference of 1932 (see **ECONOMIC CONFERENCE, WORLD**). See also **GENOA CONFERENCE**.

Cannibalism, or **Anthropophagy** (Gk. *άνθρωπος*, man *φαγείν*, to eat), the practice of eating human flesh. The word is a variant form of Carib, Caribes or Charaibes a fierce man-eating tribe of the W. Indies. Calliban is probably another variant. C. has, at some time or other, existed in almost every part of the globe, in N. and S. America, Europe, Africa, India, New Zealand, and Australia. Strabo asserted that C. existed in Ireland, and the authority for the report that the practice once prevailed in Scotland is St. Jerome. As late as 1782 gipsies were executed in Hungary for practising C. It is still known among the tribes of W. and Central Africa, New Guinea, and Melanesia. C. may often be traced to an economic cause. Even among modern civilised races it has been resorted to in cases of dire necessity, such as siege,

famine, shipwreck, etc. Savage tribes may be prompted by hunger to kill and eat men when the flesh of animals is not available. The taste for human flesh when once acquired grows into a fierce desire, which no other form of meat will satisfy, so that a gluttonous, depraved taste may sometimes account for C. Among certain African tribes, the Niam-Niam and Mombuttu, human flesh was formerly put up for sale in the market-places, and corpses of relatives were consumed as food. A. S. Amer. tribe used formerly to breed from their captive women, in order to procure a constant supply of human flesh to satisfy their needs. Higher motives for C. are those due to superstition or religion. It was thought that a man acquired the qualities of the thing he ate. Thus the heart of a lion consumed by a chief, would make him valiant in the fight. Accordingly, a man would eat his enemy in the hopes of acquiring his courage or perseverance. This motive for C. existed among the Isodones of Central Asia, mentioned by Herodotus (iv. 26). The Maoris, Australians, and Indians of N. America believed in the transmigration of souls. The eating of the enemy might, therefore, prevent his finding another resting-place for his spirit, and would secure the murderer against being haunted by the ghost of the murdered. In Australia certain tribes felt that the most fitting burial place for the deceased was within their living relatives. Such funeral feasts were attended by many religious rites. Children ate their parents so that their virtue might be retained in the family, and likewise parents occasionally ate their children. Among the anc. Mexicans and the natives of Fiji human flesh was regarded as the only fit offering to the gods, and the victims thus offered were afterwards not infrequently devoured by the onlookers. Another superstitious motive for C. existed among the 'Ham-tzon,' magicians of N.W. America, whose rule it was to eat human flesh for admittance to their order. Consult R. Andree, *Die Anthropophagie*, 1887; P. Bergemann, *Die Verbreitung der Anthropophagie über die Erde*, 1893; J. H. Wilks, *Among Congo Cannibals*, 1913; K. J. Beatty, *Human Leopards*, 1915.

Canning, process of preserving meat, fish, fruit, etc., by sealing up in cans or tins. The principle upon which this process is based is that of excluding the air from the produce. It is desired to preserve. Before C. was thought of, many methods of covering the cooked food with an air-tight coating were experimented with. These all failed for the reason that, although the air was thereby excluded, the germs contained in the air were not; these were imprisoned in the food and caused putrefaction. In C. the air is expelled and the germs killed at one and the same time by subjection to intense heat. Removal of oxygen may also be secured by exposure under pressure to an inert gas, such as nitrogen. The meat or other food is packed in cans, which are then either placed in a steam

oven, immersed in boiling water, or stood in a vat partially filled with a solution of calcium chloride and water, and then subjected to a heat of 270°F., for a length of time that varies according to the character of the food. Thus the germs and spores are destroyed; air and steam escape through a pin-hole which has been left in each can. The holes are then soldered up and the tins allowed to cool. Food thus preserved should, if the process has been perfectly carried out, remain in good condition. Experiments have proved that even after twenty years there is no sign of deterioration. This could occur only if the process were not thorough, and the presence of putrefaction could be detected by a bulging of the can due to gases developed in the course of decomposition. C. was probably invented by M. Appert of Paris about 1810, but many others made experiments in the same direction. The twentieth century has seen an enormous increase, not only in the variety of foods to be canned, but also in the quantity produced. Now canned meats, fish, soups, fruits, and vegetables of all kinds can be obtained at all seasons of the year, all over the world, the diet of each individual country being thus greatly extended. The U.S.A. still leads, as it always has done, in the canned foods industry, but the Brit. dominions are a formidable rival. In Great Britain itself the trade has increased, as it has in Norway, Spain, Portugal, Italy, and other European countries. In Japan and in the Malay States, where pineapple canneries have been started. The past twenty years especially have seen a considerable development of the C. industry in the United Kingdom and there are now a large number of factories for canning fruit and vegetables. The Campden Fruit and Vegetable Preservation Research Station, attached to Bristol Univ., gives useful scientific advice to the industry. See F. H. Woodcock and W. H. Leslie, *Canned Foods and the Canning Industry*, 1938; O. and T. W. Jones, *Canning Practice and Control*, 1941; J. G. Baumgartner, *Canned Foods*, 1943.

Canning, Charles John, Earl (1812-82). Eng. statesman, governor-general of India during the mutiny of 1857. He was the son of George C., was educated at Eton and at Christ Church, Oxford; represented Warwick in the House of Commons in 1836; and entered the House of Lords on the death of his mother, who had been raised to the peerage. Under Peel's administration C. was under-secretary of state, chief commissioner of woods and forests in 1846, and postmaster-general, 1852-55. In 1856 he became governor-general of India, and when the mutiny broke out his strong moral qualities, good administrative ability, and clear judgment enabled him to deal with the situation in a masterly way. Little expected of him by many who felt that his powers were not equal to the occasion. His policy of conciliation towards the native princes and his devotion to the work of reform and development of the country stood him

in good stead in a difficult position. His dealing with the rebellion in Oudh caused much controversy, but at the close of the troubled period he received the thanks of both Houses of Parliament. See Duke of Argyll, *India under Dalhousie and Canning*, 1865; Sir H. S. Cunningham, *Earl Canning*, 1891.

Canning, Elizabeth (1734-73), Eng. criminal around whose case raged excitement and controversy, into which Fielding entered with his *Clear State of the Case of Elizabeth Canning*, 1753. She told a mysterious tale of detention in the house of a 'Mother Wells.' Her story led to a condemnation, but on its being afterwards proved to be false she herself was transported.

Canning, George (1770-1827), Eng. statesman, was educated at Eton and Christ Church, and even in those early days showed himself possessed of unusual abilities. Favouring the Whig policy at first, the Fr. Revolution drove him, as it did so many others, to support the political party that opposed it, and when he entered Parliament in 1794 it was under the Tory banner. A couple of years after he took his seat Pitt made him under-secretary for foreign affairs, and promoted him to the office of commissioner of the Board of Control (1799), and then to paymaster-general (1800). When Pitt retired, C. did not join the Addington administration, towards which, although nominally a supporter, he acted the role of 'candid friend.' When Pitt returned to office in 1804, C. became treasurer of the navy; and, on the death of his leader two years later, he declined to serve in the Cabinet of 'all the talents.' He became Foreign Minister under Lord Liverpool, but disagreeing with Lord Castlereagh's conduct of the war, and urging his dismissal, caused him to fight a duel with the war minister on Sept. 21, 1809, in which he was slightly wounded. When Perceval came into power, C. took a long holiday abroad; but in 1816 he went to the India Office under Lord Liverpool. As a friend of Queen Caroline, he declined to take any part in the proceedings against her in 1820, and tendered his resignation, which was eventually accepted. Two years later he accepted the appointment of governor-general of India, but on the eve of his departure Castlereagh committed suicide, and he stayed at home, going again to the Foreign Office. On Liverpool's death, C. became Prime Minister and Chancellor of the Exchequer, but, quarrelling with many members of his own party, he had to rely for continuance of office on the support of the Whigs, albeit he sacrificed nothing of his policy. He only enjoyed his high office for a few months, for he d. on Aug. 8, 1827. C. had literary as well as political interests, and in 1797-98 he printed many pieces in the *Anti-Jacobin* (q.v.), including the well-known *Needy Knife-grinder*. The Contributions to the *Anti-Jacobin* were written in collaboration with George Ellis and John Hookham Frere. The *Needy Knife-grinder* was the joint production of C. and Frere. His poems were collected

in 1823. He also has a place in literary annals as a founder, with Sir Walter Scott and George Ellis, of the *Quarterly Review*, but to this periodical, so far as is known, he contributed little, though it is probable he inspired many articles. In his writings, and in letters to his intimate friends, he showed himself possessed of a fine sense of humour. As a statesman, in spite of what has been said to the contrary, C. was consistent in his views, though the frequent changes and interchanges of party do not always make it clear at a first glance. He was what may perhaps be called a progressive Tory. It was asserted, too, that he was



GEORGE CANNING

After Gainsborough

not sincere in his speeches, but that charge, too, has broken down, and a careful study of his life shows that he always spoke from the heart. As an orator, for excellence of phrasing, for admirable delivery, and for sound common sense, he has had few rivals. His speeches were pub. in 1828. There is a political biography by A. G. Stapleton, 1831. See also J. A. R. Marriott, *George Canning and his Times*, 1903; H. W. V. Temperley, *Life of Canning*, 1905, and *The Foreign Policy of Canning*, 1925.

Canning, Sir Samuel (1823-1908), Eng. engineer and one of the pioneers of submarine telegraphy. His first cable was the one connecting Cape Breton Is. with Newfoundland; then he assisted in laying the first Atlantic cable. He laid the Atlantic cable of 1865-66, inventing the grappling machinery for recovering the lost cable of an unsuccessful first attempt.

Canning Town, industrial dist. of E. of London, in the bor. of West Ham, Essex. Here are situated the extensive Victoria

and Albert docks. It has a station on the L.N.E.R. and lies at the junction of the E. India Dock Road and Barking Road.

Cannock, mkt. tn. of Staffordshire, England, near Walsall. C. Brownhills, Chase Tn., Hednesford, and other small tns. are situated in the dist. known as C. Chase, formerly a royal preserve, now a rich coalfield. Its prin. industries are mining, tool, boiler, brick, and tile making. Its pop. has grown from 2099 in 1851 to 35,000.

Cannon, see GUN.

Cannon, Joseph Gurney (1836-1926), Amer. statesman, b. in N. Carolina. As a youth he worked in a prov. store, during which period he studied law. Called to the Bar of Illinois, he soon won a successful practice, and was state attorney for seven years. In 1873 he became a member of Congress. Was a member of the U.S. House of Representatives for forty-six years, and as Speaker, which position he held from 1903 to 1911, he ruled the House with adamantino severity.

Cannon-ball Tree (*Couroupita guianensis*), species of Lecythidaceæ which is found in S. America. The fruit is a large, round, woody capsule, and this has earned for the plant its popular name.

Cannstatt, or *Canstadt*, tn. of Württemberg, Germany, on the E. bank of the Neckar, 3 m. N.E. of Stuttgart. It is noted for its mineral springs, of which there are about thirty; it is thought that these were known to the Romans. There are machinery manufs., foundries, and brick works. Fruit and wine are produced in the dist. The Fr. under Moreau defeated the Austrians under Archduke Charles in the neighbourhood in 1796. The tn. was incorporated with Stuttgart in 1905.

Cano, Alonzo (1601-67), Sp. painter, sculptor, and architect, b. at Granada. He studied painting under Francisco Pacheco, the master of Velázquez, and sculpture under Juan Martínez Montañés. In 1637, in consequence of a duel, he was obliged to flee from Seville to Madrid, where he was befriended by Velázquez. Through the influence of his fellow artist, he was appointed court painter and royal architect. C. excelled in the three arts, and on account of the universality of his genius was called the Michelangelo of Spain. He executed two colossal statues of St. Peter and St. Paul. There are beautiful specimens of his work in the cathedral of Granada, and in the Prado, Madrid.

Cano, Juan Sebastian del, Sp. navigator. He sailed under Magellan, who was killed in the Philippines. C. continued the voyage, doubled the Cape of Good Hope, and landed near Seville in 1522, being the first to circumnavigate the world. Charles V. gave him a pension and a globe inscribed with the motto *Primus me circumdedit*. He d. in 1526.

Canobus, see CANOPUS.

Canoe (from a Caribbean word through the Sp. *canoa*), term for a boat which has both ends pointed and which was formerly

propelled by paddles only, but now sometimes by sails alone or in conjunction with paddles. The paddles are manipulated without mechanical contrivances like those used to hold oars in position. The paddler paddles first on one side of the boat, then on the other, sitting in the 'well,' a characteristic feature of the modern C., as distinct from the primitive boat, which was open from end to end. The primitive C., used by the anct. Britons, the Eskimo, the N. Amer. Indian, etc. was simply the hollowed trunk of a tree, or else a simple frame of wood covered with skins or bark. This C. called a 'dug-out,' made from trunks, was hollowed either by fire, stone implements, or shells. Many of these have been unearthed in the Brit. Is., and they are still used by the Africans. A famous example of this C. is exhibited in the New York National Hist. Museum; it is 63 ft. long, and nearly 4 ft. wide. Canoeing as a modern sport in England began with the lectures of John MacGregor and the construction of his renowned C., the *Rob Roy*, together with the publication of his books, *A Thousand Miles in the 'Rob Roy' Canoe*, and *The 'Rob Roy' on the Baltic, the Jordan, and the zuyder zee*, 1850-66. The *Rob Roy*, designed for long journeys in the waters of the E., was built of oak with a cedar deck, was 14 ft. long and 26 in. wide; it had 7-ft. paddles, and its sails were dyed blue on account of the glare of the sun; its weight, everything included, was 70 to 72 lb. The *Rob Roy* became the type for the Brit. C. The sailing C. is about 15 ft. long, has a deck seat and tiller, its cockpit is small and its sail area correspondingly augmented, it contains air and watertight bulkheads, and is fitted generally with two sails. W. Baden-Powell with the *Nautilus* and his book *Canoe Travelling* was the pioneer of the cruising C. The Royal Canoe Club (founded 1866) lays down the rule that these Cs. may not weigh more than 200 lb. and that their sail area may not exceed 75 sq. ft. These vessels can attain a speed of 40 m. a day in smooth water, racing Cs. can cover 8 m.p.h.; these are 20 ft. long and 18 in. wide. Present day crews sometimes sit on the side of the deck, and not in the well; this device helps to balance the wind pressure. The cruising C. is equipped with paddles and sails, the racing vessel has sails only. Modern Brit. Cs. are usually made of oak, cedar, or pine; there have been Cs. made of paper, of tin, and of india-rubber. Amer. Cs. are generally built of cedar, mahogany, or bass-wood, or on the lines of the Indian birch bark C., and made of painted canvas, bark, or compressed paper. The 'Canadian,' a type of the former, is constructed on a mould over which alternate strips of dark and light timber are laid while still moist from a steaming process they have undergone. The strips are grooved, bound, and glued together; this forms the outer skin; the inner skin is composed of broader strips placed crosswise. 'Folding' or 'collapsible' Cs. built somewhat on the lines of the Eskimo kayak, are a favourite

craft. In these, the two halves of the framework of ash rods and metal cross-frames are slipped into each end of the skin, and the central flooring locks everything correctly into position. See W. J. Luscombe and L. J. Bird, *Canoeing*, 1936, 1948.

Canon (Gk. *κανών*), a straight rod, hence measuring rod, or rule; metaphorically, anything which regulates or keeps straight), term used in a number of special senses as shown below; applied in early times to various rules of faith. By the fourth century the word had come into use to describe the rules of faith and practice put forward by councils of the Church. Thus there are the Cs. of Nicæa in A.D. 325, and the Cs. of all the councils since that date. The term also describes the list of saluts honoured by the Church, and also the central portion of the liturgy, including the consecration of the sacred elements. For an account of Cs. in general see **CANON LAW**.

Canons of the Church of England.—A body of 141 Cs. or eccles. constitutions drawn up by the Convocation of Canterbury in 1604, and approved by the Convocation of York, being finally sanctioned by the king. They were drawn up as a result of the Hampton Court conference, to the conclusions of which they were designed to give effect. In 1640, Convocation (*q.r.*) remained sitting after the Parliament had ceased to sit, and, after revising the 1604 Cs., pub. seventeen more which never received parl. or royal sanction. Their binding force has, in consequence, been much questioned, and in consequence of their unpleasantly aggressive character, they are generally discredited. Except for those parts which have been superseded by later regulations of equal or greater authority, such as the rubrics of the Book of Common Prayer, 1661, the 1604 Cs. are still binding on the clergy, who at their institution to a benefice promise *canonical* obedience to their bishop. A Commission under the chairmanship of the archbishop of York (Dr. C. F. Garbett) was appointed in 1939 to prepare a revised body of Cs. Its report, which was not pub. until May 16, 1947, would, if accepted, have far-reaching effects on the religious life of the nation and involve a new relationship between Church and State. A tribunal to hear nullity suits and, in appropriate cases, overrule for religious purposes, the decision of the civil court so as to permit the parties to remarry with the rites of the Church of England is one of the recommendations. The report also proposes widespread new powers for eccles. courts to exercise greater discipline over clergy and laity. The Commission also recommends that the jurisdiction of the Privy Council as an appeal court be abolished, and a new court estab. consisting of the archbishop of the prov. and four other members, of whom two shall be members of the Upper House of Convocation and two members of the Church of England, who have held or hold high judicial office. It also recommends that a court for the trial of bishops be

estab. in each Prov. The Report emphasises the need for the study of eccles. law and suggests the setting up of clergy, historians and lawyers to this end. The Report came before the Convocation in the following year.

Canons, Book of.—In Scottish eccles. law, a body of constitutions for the regulation of the Church in Scotland prepared by the bishops of that country and confirmed by letters patent under the Great Seal in 1635, after they had been revised by Laud. In the next year they were pub. at Aberdeen, and caused discontent throughout the country on account of the stringency of their regulations. The king's supremacy in matters eccles. was emphasised.

Scriptures.—The C. of the O.T. and N.T. comprises those books which are held to be authoritative and of divine inspiration. See further under **BIBLE**.

Church Minister.—The institution of bodies of clergy, known as Cs., living a cenobite life under no very clearly defined rule dates from early times. In the early part of the fourth century the clergy at Vercelli were so united, and St. Augustine of Hippo also followed this system in the following century. At the Lateran at Rome there was also an early foundation of the same kind. The practice became more general in the eighth century, when Chrodegang, bishop of Metz (742-766), drew up a definite rule for Cs., founded largely on the Benedictine rule, but owing something to the traditional rule of the Lateran. In 816-17 Louis le Débonnaire made this rule binding on all Cs. throughout the empire. In course of time the institution deteriorated, and a distinction between Cs. regular and Cs. secular was made. The former observed the rule, while the latter, frequently laymen, were mainly administrative dignitaries. Various attempts were made at reform, notably by the papal synods of 1059 and 1063. These councils insisted on the original plan of the common life, and also urged the necessity of poverty, for canonries were often considered merely as lucrative sinecures. A new rule, founded chiefly on the writings of St. Augustine, was now made, and those observing it were known as Augustinian Cs. There were over 200 houses of Augustinian Cs. in England at the Reformation. Since that date few attempts have been made to improve the system of Cs. regular. The chief orders of the kind in the Rom. Church are those of the Lateran and the Premonstratensians. Many foundations were entirely abolished at the Reformation. In both the Rom. and Anglican Churches the title is also used for those clergy who are connected with cathedral churches, and form the cathedral chapter.

Music.—A C. is a form of composition, based on rule and written in strict imitation. The introductory theme or melody is taken up and repeated note by note in succession, and at set intervals, by the other part or parts. This kind of composition was introduced about the twelfth century, and, with the fugue, is the most

difficult study in the art of musical composition.

Canon, *see* CANYON.

Canonbury, dist. of London, in the bor. of Islington, with a railway station. C. Tower in C. Place, dates from the sixteenth century.

Canon City, co. seat of Fremont co., Colorado, U.S.A., situated 90 m. from Denver on R. Arkansas. It has rich coal-mines, and there are large quantities of copper, iron, petroleum, and limestone. The zinc-lead smelting works are the largest in the world. It is an important health resort owing to its hot mineral springs and mild climate. Pop. 6000.

Canoness (Lat. *canonica*; Ger. *Kanonissin*). In the eighth century, chapters of Cs. were instituted throughout the Frankish empire, in imitation of the chapters of canons. These consisted of associations of women, generally of high birth, under a somewhat lax rule, bound by the vows of chastity and obedience, but not by that of poverty. They had a common table and dormitory, and were bound to the recitation of the Breviary, but they were not cloistered. Generally, they were engaged in education and needlework, teaching the embroidery of vestments and the transcription of religious books. As in the case of the canons, a distinction was *long* drawn between regular and secular Cs., the latter being mere feudal princesses. At the Reformation many of these institutions became Protestant, and remained almost intact, with slightly altered rule, surviving to the present day.

Canonica, Luigi (1762-1844), It. architect. He designed the arena or amphitheatre in Milan, which was begun in 1805 by order of Napoleon, who hoped to propitiate his Milanese subjects by embellishing their capital. He executed many public and private buildings at Milan, the chief being the Casa Canonica, the two theatres, Rò and Carcano, and the interior of the Palazzo Orsini.

Canonical Hours, certain hours of the day and night appointed by the Rom. Catholic Church for the reciting or chanting of the different parts of the divine offices. They are not now strictly adhered to as a general rule, but many of the monastic orders continue to observe them regularly. The hours are called Prime at 6 a.m.; Terce, 9 a.m.; Sext at noon; None from 2 to 3 p.m.; Vespers about 4 p.m.; Compline at 7 p.m.; Matins and Lauds at midnight or daybreak.

Canonicals, term used to describe the official dress of the clergy. *See* under VESTMENTS, SACRED.

Canonisation, declaration by which the pope publicly proclaims a servant of God to be numbered among the saints honoured by the whole Rom. Church. In the early ages there was no formal act of C., as it was only in their own locality that martyrs were venerated. The first traces of a judicial procedure appear in Africa, but this was demanded chiefly by the peculiar position of the Church there. During the early Middle Ages, it rested with each bishop to decide what saint

shall be honoured in his diocese, and on what day. However, much carelessness crept in, and several scandals arose from the seventh to the tenth century, men of evil life being inscribed among the saints. The policy of centralisation also tended to bring the act of C. under the papal power. The earliest known case of C. by the pope is that of Ulric of Augsburg by John XV. in 993. At the end of the twelfth century, by decrees of Alexander III. (1170) and Innocent III. (1200), the right was exclusively reserved to the Rom. Court. This rule was made more stringent by Urban VIII. in two constitutions (1623 and 1634), and the procedure of the process was then laid down. With slight modifications it is in force at the present day. It was strictly forbidden publicly to venerate in any fashion any person not papally canonised. Two exceptions were made, those who had received immemorial *cultus*, and those whose *cultus* had been sanctioned by preceding popes. Those falling in either of these classes receive what is known as *equipollent* C. The procedure of *formal* C. is as follows: Fifty years must elapse after the death of the candidate. A court is then instituted by the ordinary of the dist. where the claim is made, and material is gathered on which the case may be judged. The materials are then sent on to the Congregation of Rites at Rome, and after a lapse of ten years, the case is *introduced*. The claimant may now be called *Venerable*. After proof of two miracles performed at the candidate's intercession, and also that the candidate possessed Christian virtues to a heroic degree, his *beatification* (q.v.) is performed. After the proof of two more miracles since beatification, the pope then proceeds to canonise the *Beatus*, assign him a feast day, mass, and propose him for universal veneration. Finally there is a solemn mass of the new saint in St. Peter's preceded by a reading of the bull of C.

Canon Law, body of law by which the government of the Church is carried on by ecclesiastics. The canons are enacted by general councils or prov. synods, and are often enforced by the civil power, which ratifies them and makes them legally valid. The body of E. C. L. is easy of access and small in extent. It may be found in the *Nomocanon* of Photius of Constantinople (800), and the *Synodikon* of Bishop Beveridge (Oxford, 1672-82). The W. C. L. is extremely voluminous, and is in a confused state owing to accretions, interpolations, forgeries, etc. At the Council of Basle all previous collections were gathered together as the *Corpus Juris Canonici*, but this ed. must now be supplemented by many papal decrees, the canons of later councils, etc. It is in force throughout the Rom. Catholic Church. During the Middle Ages the study of C. L. was the prin. and most lucrative occupation of candidates for eccles. offices.

Canon Law in England.—In England the C. L. affects the laity only very slightly; but in the Middle Ages its operation and force were a matter of

frequent experience. Thus, all questions appertaining to the probate of wills, the contract of marriage, and all cases in which one of the parties was a *clericus*, fell within the prov. of the C. L. Furthermore, the Church possessed a formidable hierarchy of courts in which to prosecute suits and enforce penalties. Early Eng. historians, inspired by the Tudor rejection of foreign jurisdiction, maintained the theory that 'the canon law of Rome, although always regarded as of great authority in England, was not held to be binding on the courts.' But modern research has estab. that the pope's jurisdiction did prevail and that the Rom. C. L. was in operation precisely as elsewhere in W. Christendom. Yet there were stages and degrees in the hist. of the operation of this law in England; thus, with the Norman Conquest, came the famous decree of William I. separating the eccles. from the civil courts, thereby opening the way to Lanfranc's introduction of a collection of canons, including the forged decretals (see ISIDORIAN DECRETALS) and, later, to Henry II's conflict with Becket, which led to the substantial victory of the papacy, though in some respects, notably in matters relating to eccles. patronage, England continued to follow its own course and to ignore the C. L. In these earlier times there were peculiarities of eccles. procedure which could not be expected to find favour with the laity, e.g. the presumption of guilt in the accused until he could prove his innocence (the converse rule prevails in common law). Hence it is not surprising that in the sixteenth century the jealousy of the civil lawyers over the exclusive jurisdiction maintained by the practitioners of the C. L. readily combined with the anti-papal attitude of the Tudors to overthrow much, but by no means all, of the medieval system. By the Act of Submission of the Clergy of 1534 provision was made for a commission to survey the existing C. L. which meanwhile was to continue to prevail except when repugnant to the royal prerogative or to the customs and laws of the realm. The failure to implement this revision of the C. L. led to considerable uncertainty as to which parts retained their validity. Under the Act of 1534 the convocations were empowered to make new canons, subject to royal assent. Thus James I. authorised the 141 canons of 1604 made by Canterbury Convocation. Coke, however, held that only the clergy, and not the laity, were bound by them. Meanwhile, Thomas Cromwell greatly prejudiced the academic study of C. L. by ordering the univs. in 1535 to substitute lectures in civil law for those in C. L., while in 1540 Henry VIII. founded regius professorships in civil law at Oxford and Cambridge. Further, by an Act of 1545, laymen who were doctors only of civil law were permitted to be judges in the eccles. courts. Thus, in principle, the victory of the civil over the C. L. was won, and although Doctors' Commons continued until 1857 as a centre for lawyers learned

in C. L., both the eccles. law and the Church courts fell into increasing abeyance, especially after the Toleration Act of 1689. The projected (1948) Anglican revision of its C. L. cannot, of course, presuppose a return to any degree of its medieval influence; what is aimed at is merely the restoration amongst clergy and laity of the estab. Church of an agreed body of eccles. rules to form the basis of consensual obedience.

Canonsburg, bor. of Pennsylvania, near Pittsburgh, U.S.A. Pop. 12,000.

Canopic Vases, called after the anct. tn. of Canopus, used by Egyptian priests to hold the viscera of embalmed bodies. The jars were generally made of stone, and the lids were frequently shaped like four human heads, supposed to represent the four genii, the sons of Osiris.

Canoppi, Antonio (1773-1832), lt. artist. He was first engaged as a fresco-painter by various lt. nobles; later he became a scene-painter at the Venice Theatre, Venice, and afterwards at Mantua. In Moscow, where he sought refuge during the Napoleonic wars, he decorated the hall of the senate and other public buildings, but his work was destroyed in the great fire of 1812. In 1811 he went to St. Petersburg, where he remained till his death. At the Imperial Theatre he executed a number of architectural scenes, including those for the operas of the *Zauberflöte* and *Semiramis*, which excited the highest admiration. Author of *Opinion d'Antoine Canoppi sur l'architecture en général et en spécialité sur la construction des théâtres modernes* (1830).

Canopus, or Canobus, anct. city of Egypt, situated about 14 m. E. of Alexandria, on W. mouth of the Nile, called after the city the Canopic mouth. C. was the pleasure resort of the anct. Alexandrians. Ruins of the famous temple of Serapis were excavated in 1893 near the modern village Aboukir.

'**Canopus**,' name of a first-class Brit. battleship of 1897 class, launched in 1898, and of 12,950 tons burthen. Just after outbreak of First World War this ship joined Admiral Craddock's squadron. Owing to its being old and slow, Craddock did not bring it into action at the battle of Coronel (Nov. 1, 1914). After the battle it escaped to the Falkland Is., and was there when Admiral Sturdee sank von Spee's fleet on Dec. 8, 1914. The name was first used in the Royal Navy in 1798, and was associated with the engagement off San Domingo, 1806, and the passage through the Darienelles, 1807.

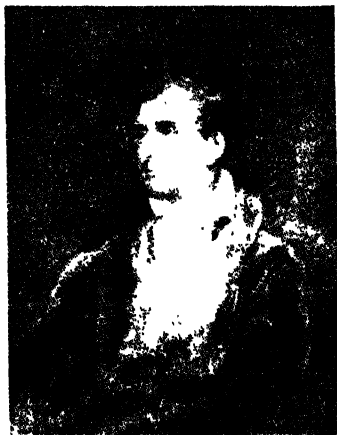
Canopus, second brightest star (magnitude -0.9) in the heavens, situated in the constellation Argo. It is extremely remote, and of enormous luminosity. Proper motion 2 in. per century.

Canopy (Gk. *καυώμιον*, from *καύωμι*, a gnāt, lat. *canopium*). The word was used by Herodotus (book II.) in speaking of the nets with which the Nile fishermen protected themselves from mosquitoes. Hence it is used for any covering, but in particular for such as is projected at a height over a bed or throne, or over a conveyance in state processions. In

architecture the word denotes the projection over an altar or tomb, a feature of the decorative period in Gothic architecture. It is also used of a moulding overhanging a door, porch, or window.

Canosa di Puglia, tn. of S. Italy, in the prov. of Bari, 13 m. S.W. of Barietta. It occupies the site of the ant. Apulian city Canusium. The tn. contains the cathedral of San Sabino (built 1101), which holds the tomb of Bohemond I.; a ruined castle, built by Charles I. of Naples, and the remains of an amphitheatre and an old aqueduct. Many interesting relics of antiquity have been found at C. and removed to the museum at Naples. The Roman bridge was blown up in the Second World War, but all the other monuments were undamaged. Pop. 27,000.

Canossa, vil. in the prov. of Reggio nell' Emilia, Italy, 14 m. from Reggio. Noted for its castle, now a ruin, where the Emperor Henry IV. humiliated himself before Pope Gregory VII. in 1077.



CANOVA

An engraving from a painting by
Sir T. Lawrence

Canova, Antonio (1757-1822), It. sculptor and painter, b. at Possagno, in the prov. of Treviso. He came of a family of stone-cutters, and at the age of fourteen entered the atelier of the sculptor Torretti, through the help of his patron, Giovanni Falleri, a Venetian senator. C. accompanied his master to Venice, and, after Torretti's death, studied under his nephew Ferrari and at the Venetian Academy. At the age of fifteen C. executed statues of 'Orpheus' and 'Eurydice' (according to some he worked on the Orpheus statue in 1773-75), and at twenty-two he had finished his famous 'Dædalus and Icarus', now in the Venetian Academy. In 1779, through the influence of his friend Falleri, C. was awarded a pension by

the Venetian Gov. In 1780 he went to Rome to study, and, finding little to attract him in the conventionality of modern art, he found his inspiration in classic sculpture. He exhibited in 1782. Before long, he was acknowledged as the first sculptor of his day. C. was three times summoned to Paris by Napoleon. He carved the well-known bust of Napoleon in the Pitti Palace, and also Pauline Borghese as a reclining Venus, and the Empress Maria Louisa as Concordia. C. also executed many commissions for the pope, on whose account he suffered exile during the revolution of 1798-1800. In 1816 he was created marquis of Ischia, and his name was inscribed in the Golden Book of the Capitol. He d. at Venice, and was buried in the church he himself built at his bp. His famous 'Cupid and Psyche' is in the Louvre. Among his other well-known pieces are 'Hercules throwing Lichas into the Sea,' 'Perseus,' 'Venus and Adonis,' 'Hebe pouring Nectar,' 'Theseus and the Centaur,' and 'Mars and Venus.' See Lives by Quatremère de Quincy, 1834, and A. G. Meyer, 1898.

Canovas del Castillo, Antonio (1828-1897), Sp. statesman and historian, b. at Málaga. He became a member of the Cortes in 1854, was made minister of the Interior 1860-61, was Premier 1875-81, and held this office six times at intervals up to 1897. C. was a member of the Sp. Academy from 1867 till his death. He ed. and directed the publication of *Historia General de España*, and pub. many works. In politics he was the leader of the Conservatives. He was assassinated by an anarchist at Santa Agueda.

Canrobert, François Certain (1809-95), marshal of France, b. at St. Céré in dept. Lot. He first became noted through his valour, displayed in the Algerian wars of 1835 and 1841-51. He also rendered Louis Napoleon great service in his *coup d'état* of 1851. When the Crimean war broke out he was given command of the first div. of the Fr. army, but on the death of Marshal Saint-Arnaud he was made commander-in-chief. Although twice wounded, he completed the lines of investment at Sebastopol. He resigned his command in May 1855 through a disagreement with Lord Raglan. He fought at Magenta and Solferino in the It. wars in 1859, and in the Franco-Ger. war, 1870. He was besieged at Metz, but had to surrender, and was thereupon imprisoned in Germany.

Canso: 1. Cape in Nova Scotia, on the N.E. extremity, and on the S. side of Chedabucto Bay. 2. Strait, 17 m. long, between Nova Scotia and Cape Breton Is.

Cant, in architecture, term applied to the corner of a square cut off octagonally. In building a C. brick is one cut on the slant. It is also applied to a ship's timber, forward or aft, lying obliquely to the keel.

Cant, Andrew (1590-1663), Scottish preacher and leader of the Covenanters. He became minister of Pittislog in Aberdeenshire in 1633; of Newbattle, Midlothian, in 1638; and of Aberdeen in 1640

In July 1638 he was made a commissioner for the purpose of converting people to Presbyterianism, and in the same year he took an active part in the celebrated assembly which was held at Glasgow.

Cantabile, terms used in music to express great smoothness in manner of performance. Often trans. as 'to be played in a singing manner.' Its opposite might be said to be the term *maestoso* See CANTILENA.

Cantabri, anct. race of mountaineers, living in the N. of Spain to the S. of the bay of Biscay, which was called after them, Oceanus Cantabricus. They were of Iberian origin, and are now represented by their descendants, the Basques of the Pyrenees. The Cantabrian war which they waged with Rome lasted for six years (25-19 B.C.), and was finally concluded by Agrippa. Rom. garrisons were stationed in their country, but they never gave up their independence.

Cantabrian Mountains, range of mts., W. of the Pyrenees, and stretching for 300 m. along the N. of Spain.

Cantacuzenus, Gk. family of royal birth. (1) Johannes C. (c. 1292 - c. 1380), Byzantine soldier and historian, b. at Constantinople. He was chief adviser to Andronicus III., 1328-41, who left him as guardian and regent to his son, Johannes V., then a boy of nine. C. was suspected by the queen-mother, fled from Constantinople, and proclaimed himself emperor. After a civil war lasting six years, peace was made; he was declared joint emperor, 1347, and his daughter married to the young Johannes. In 1354 C. was forced to abdicate. He retired to a monastery, where he wrote a hist. of his times from 1320 to 1357, and a defence of Christianity. (2) Matthias d. 1383, his son, waged war for two years, after his father's retirement, against Johannes V., but was unable to make himself emperor. (3) Manuel (d. 1380), the brother of Matthias, and governor of Peloponnesus.

Cantal, central dept. of France, in the S. part of the old prov. of Auvergne. It has an area of 2217 sq. m. The region is occupied by an extinct volcanic mass, the highest peaks being Plomb de Cantal (6095 ft.) and Puy Mary (5850 ft.). Cattle are bred, and part of the country makes good arable land. Rye, potatoes, and chestnuts are the chief products. The only two rivs. of any importance are the Truyère and the Dordogne. Cap., Aurillac. Pop. 197,000.

Cantaloupe, small, round, ribbed musk melon; so called from the castle of Cantalupo in the Marca d'Ancona, Italy. The word is much used in the U.S.A. and in Canada, where it is applied to a variety of edible melon much grown in those countries and marketed in great quantities.

Cantarin, Simone (1612-48), It. painter, called Pesarese, or Simone da Pesaro, b. at Orpezza, near Pesaro. He was first a disciple of Parmigino and Clandio Ridolfi, and afterwards of Guido Reni, whose style he approached very nearly. Unsuccessfully started a school at Bologna. He painted the portrait of the duke of Mantua, but was mortified at the result,

and d., possibly of poisoning, at Verona. C. was a good colourist, but his work lacked character and originality. He dealt chiefly with religious subjects; his best known paintings are: a portrait of Guido in Pesaro; the 'Assumption' in the Bologna Gallery; 'St. Thomas placing his fingers in the side of Christ' at Naples; and 'Joseph and Potiphar's Wife' in the Dresden Gallery.

Cantata (Lat. *cantare*, to sing), in music, term applied to certain forms of composition for solo voices and chorus, with instrumental accompaniments; sacred or secular in character. In the former case it resembles an oratorio, but is shorter; in the latter it may be compared to an opera, but it has no stage accessories. Originally, a C. was a musical theme sung by one person to a single instrument.

Canteen, refreshment house attached to a barrack. In the Brit. army, men are supplied with certain rations, and have to buy their other necessities at the C. Cs. were once kept by civilians but in 1857 they were put under the control of the War Office, and became a recognised army institution. They were managed by a small committee of officers, and the goods were sold at practically cost price, any profit being spent for the benefit of the corps. A C. consisted of a beer shop, a grocery shop, and a coffee bar. The last-named supplied all kinds of non-alcoholic drinks. In America the sale of intoxicants has long been prohibited in Cs. In France, the C. is a club room used by the whole regiment for social purposes. The word has also come to be applied to the place where meals are provided by an industrial or other organisation for the benefit of members of its staff.

The First World War revolutionised the Brit. C. system. The existing organisation proved inadequate to provide for millions of men and women in the fighting services in all parts of the world. In 1915 an organisation called the Expeditionary Force Canteen (E.F.C.) came into being to conduct the C. business overseas. After paying working expenses and repayment of loans, all profits were devoted to the general welfare of the troops at the discretion of the Army Council. In 1916 the Navy and Army Canteens Board (N.A.C.B.) was formed, whose main business lay in the United Kingdom, but it also maintained Cs. in permanent stations overseas. The profits were dealt with in a manner similar to those of the E.F.C. The E.F.C., being a purely war-time concern, ceased to exist in 1919, and its stock, etc., was taken over by the N.A.C.B. In 1920 an inter-departmental committee recommended that the N.A.C.B. should be enlarged and made permanent, and this found effect in the Navy, Army and Air Force Institute (N.A.A.F.I.), which is under the control of a council of members of the three services. The surplus profits of the E.F.C. and N.A.C.B. were handed over to the United Services Fund, after the dominions, colonies, and U.S.A. forces had been given an agreed share. The operations of the N.A.A.F.I. extend to

every station at home and abroad where there are Brit. sailors, soldiers, and airmen, and a percentage of the profits in each locality are paid into unit funds. The N.A.A.F.I. system and its overseas counterpart, E.F.I. (Expeditionary Forces Institute), operated satisfactorily throughout the Second World War.

Cantelan, tn., prov. Mindanao, Philippine Is., 47 m. S.E. of Surigao. Pop. 7500.

Cantelupe, Thomas de (c. 1218-82), Eng. bishop, nephew of Walter de C. He studied at Oxford, Paris, and Orleans, and became chancellor of the Oxford Univ. (1262-63), and lectured in theology at Paris and at Oxford. He was appointed Lord Chancellor of England (1265), and was consecrated Bishop of Hereford in 1275. He became involved in a dispute with Archbishop Peckham in the Council of Reading (1279), who excommunicated him in 1281. C. appealed to Rome, and on his way to Italy d. at Orvieto. He was buried in his own cathedral, and was popularly regarded as a saint, owing to the miracles that were worked at his tomb. In 1320 Pope John XXII. canonised him as St. Thomas of Hereford.

Cantelupe, Walter de (d. 1266), Eng. bishop. He held sev. rich rectories in plurality, and strongly resisted the interference of papacy in England. He was consecrated bishop of Worcester at Viterbo in 1237. He defended pluralities against Otho (1237), opposed the papal demand of a tenth for King Henry III. (1252), and the further encroachments on Eng. liberty made by Rome in 1251 and 1255. He supported the barons in 1264-1265, and was summoned to Rome, but d. before leaving England.

Cantemir (or **Kantemir**), **Demetrius** (1673-1723), member of a noble family of Moldavia. He was elected prince of Moldavia in 1710, owing to the fact that war with Russia seemed imminent. C. obtained an alliance with Peter the Great in the following year, with a promise of help against the Turks. Peter was defeated in his campaign to the Pruth, and C. took refuge in the Russian capital. He was one of the founders of the St. Petersburg academy, and wrote in Lat., Gk., Rumanian, and Turkish. His chief works are *Historia de Ortu et Defectione Imperii Turcici* (trans. into Eng. by N. Tindal in 1756); *Descriptio Moldaviae*; a geographical, ethnographical and economic survey of Moldavia, and a hist. of oriental music, which is no longer extant. This treatise was written in Turkish and is said to have been the first musical treatise produced in Rumania.

Canterbury, city, parli. and co. bor. of England, in the co. of Kent, on the R. Stour, 56 m. E.S.E. of London. It is a cathedral city, the see of the primate, and the eccles. metropolis of all England. C. occupies the site of the Rom. Durovernum. It was an important fortress and military station, being situated on the highway to London from Dover. To the Saxons it was known as Cantwarabyrig, 'town of the men of Kent,' and was the cap. of the kingdom of Kent. The see was founded

about 597, when St. Augustine became archbishop of Canterbury, and from this centre Christianity spread through England. (See CANTERBURY CATHEDRAL.) The King's School, founded by Henry VIII. in 1541, is attached to the cathedral. There are many anct. churches in C., the most notable being St. Martin's, part of which is built of Rom. brick and tile of the sixth century; in its font St. Augustine is supposed to have baptised King Ethelbert; and St. Dunstan's, containing the burial-vault of the Roper family, with the head of Sir Thomas More. C. has the ruins of a Norman keep, a guildhall (1439; rebuilt 1697), and a hospital for poor brethren, founded by Archbishop Lanfranc. The Chequers Inn, immortalised in the *Canterbury Tales*, and an anct. artificial mound, Dane John, possibly a corruption of donjon, are of special interest. The most famous archbishops have been St. Augustine, St. Dunstan, Lanfranc, Anselm, Becket, Crammer, and Laud. The archbishop of C. is the first peer of the realm, and crowns the sovereign in Westminster Abbey. The city's chief trade is in hops and grain. The industry of weaving, introduced by the Walloon and Huguenot refugees, who settled in C. in large numbers, at one time employed 2000 persons and has of late years been to some extent revived in the old, gabled, half-timbered houses of the C. weavers. Charles Dickens used to stay at the Fleur de Lis Hotel, which retains a thirteenth-century window. The author of *The Ingoldsby Legends* was b. here. An engine built by George Stephenson in 1825, and used on the C. and Whitstable railway is preserved here. The Buffs' war memorial is in St. Michael's Chapel in the cathedral, the Kent co. war memorial on the bowling green, and the city of C. war memorial opposite Christ Church gate. The cathedral escaped destruction in the Second World War but of the rest of C. damage from air attack extended over one quarter of the city area. Subsequent demolitions revealed considerable Rom. remains. One of the most important discoveries since excavation was begun in the bombed area of C., to ascertain the layout of the Rom. city, was made in 1948, with the finding of the massive remains of the Rom. public baths of the city, with walls more than 5 ft. thick. The city returns one member to Parliament. Pop. 22,000.

Canterbury, prov. dist. in the centre of S. Is., New Zealand. It covers an area of 14,040 sq. m., 3900 sq. m. of which form the C. plains sloping from the mts. to the coast. The wheat-growing and sheep-rearing for which this part is noted are all carried on in this dist. It is from here that the celebrated C. lamb and mutton of the Eng. market comes. Dairy-farming and cheese-making, also cocksfoot grass seedling, are the prin. industries of Banks peninsula, a volcanic region with rich soil. The cap. is Christchurch, and the chief ports are Lyttelton in the N. and Timaru in the S. Pop. 233,000.

Canterbury Bells, see CAMPANULA.
Canterbury Cathedral. The earlier church, said to have been given by King Ethelbert, together with his own adjoining palace, to Augustine and his monks, was almost entirely destroyed by fire in 1067. This earlier cathedral was planned on the lines of the old basilica of St. Peter's, Rome. Archbishop Odo (942-59) raised the walls and rebuilt the roof. After the fire of 1067 Lanfranc decided to rebuild the shattered church anew and completed the work in a few years. Anselm rebuilt part of Lanfranc's building and Prior

present, the predominant styles being the Transition-Norman and the Perpendicular. The E. part of the cathedral illustrates the whole period of the transition from Norman art to Pointed, and is consequently one of the most valuable buildings in Britain for the purpose of study, as well as one of almost unrivalled beauty and splendour. The present building is therefore a hist. in stone of eccles. architectural progress covering nearly four centuries from Lanfranc to Goldstone. The numerous chapels originated from the great wealth of relics



CANTERBURY CATHEDRAL

Will F. Taylor

Conrad completed the choir. In 1172 the whole edifice was again devastated by fire, but the disaster gave an opportunity of building a cathedral on a scale worthy of the martyred St. Thomas à Becket. The chief artificer during the twelfth century was a Frenchman, Wm. of Sens, and by 1184 the choir, much as it exists to-day, was complete. The side screens were added by Prior Henry de Estria in the opening years of the fourteenth century. Between 1376 and 1410 Lanfranc's nave was replaced by that of Prior Chillenden and, with the addition of the latter's transepts and Cardinal Morton's great central tower, the building was completed in 1495. The cathedral is in the form of a double cross, with a central and two W. towers. The total length is 523 ft., the E. transept measuring 164 ft. Various styles of Gothic architecture are

possessed by the Church and the necessity of finding shrines for them. These relics included those of the martyred bodies of saints—Blasius, Dunstan, Wilfrid, and Alphego—but of course the most important was that of Becket, whose shrine stood in the Trinity chapel immediately behind the high altar. It is not too much to say that in the Middle Ages C. C. owed its European fame and great riches to the fact that it contained this shrine. The body was first interred in the crypt, but in 1220 it was translated to the then newly erected chapel on the site of that in which Becket had first solemnised mass after becoming archbishop. The universal veneration inspired by the martyr is illustrated by Chaucer's *Canterbury Tales*. Yet in 1538 Henry VIII. solemnly issued a writ of summons against Thomas à Becket sometime archbishop of Canter-

bury, accusing him of treason and contumacy, and the shrine was dismantled—the very pavement on which the shrine stood being destroyed by the king's commissioners—and the gold and jewels removed from the shrine, which, from the early thirteenth century had been enriched by numerous costly gifts from royal and other pilgrims. Further destruction was wrought by the iconoclasm of the Puritans, notably by Richard Culmer. The windows were shattered, the choir stripped, and the monuments defaced. In 1872 fire destroyed the outer roof of the Trinity chapel. Since that time the Bell Harry tower was restored. Christ Church gate, by which the precincts are entered, was built in 1517 by Prior Goldstone II., and though weather-worn remains a striking example of Perpendicular work. The S.W. porch, the principal entrance to the cathedral, was built by Chillenden, c 1400, but the figures in the canopied niches are of much later date.

The Nave.—Lanfranc's nave survived till the fourteenth century, when it was rebuilt with the exception of one W. tower, taken down in 1834. Chillenden's nave resembles that of Winchester which was erected about the same time. The aisles are narrow and lofty. The clustered pillars resemble a natural forest of stone. Owing to the *crisis* the choir is raised well above the level of the nave, which is very high in proportion to its length. The monuments in the N aisle include that to Archbishop Benson (1896). The font, which is of extraordinary shape, dates from 1636. Near the E. end is a marble monument to the men of H.M.S. *Kent* (battle of the Falkland Isles, Dec. 8, 1914). The easternmost window of the N. aisle is to the memory of Dean Stanley. In the S. aisle is a tablet to Dean Farrar (1903). The piers supporting the central tower are the original piers of Lanfranc's building, but cased with Perpendicular work by Chillenden. From one pier hangs the flag flown by H.M.S. *Canterbury* at the battle of Jutland.

The *Choir* is the most important specimen of Transition-Norman work in the country. Both the pointed and rounded arch are used. It was the work of William of Sens (killed by injuries received in a fall from the scaffolding in 1197) and of his successor William the Englishman (1174-84), finished under the direction of Prior Conrad, whence its description as the 'glorious choir of Conrad.' The Decorated screen which surrounds the choir was constructed by Prior de Estra (1304). Gervase of Canterbury (*q.v.*) in chronicling the difference between the new work and the older Romanesque choir of Conrad, describes the changed mode of workmanship and design. The pillars were elongated by almost 12 ft. In the old capitals the work was plain, in the new ones exquisite in sculpture. In the old, the arches too were plain or sculptured with an axe rather than with a chisel. There were no marble columns; here were many. There in the circuit around the choir, the vaults were plain, but in the

new they are arch-ribbed and have key-stones. In the old was a wooden ceiling decorated with excellent painting; but here is a beautifully constructed vault built of stone and light tufa; and finally the single triforium has given place to two in the choir and a third in the aisle of the church. The monuments in the choir are nearly all of eccles. dignitaries, the most conspicuous being that in memory of Archbishop Chichele (1414-1443), founder of All Souls', Oxford. The S.E. transept is an adaptation of the work of Ernulf by William of Sens conformably to the new design of the choir.

St. Anselm's chapel forms part of the tower of the same name and was originally dedicated to Saints Peter and Paul. Above it is a small watching chamber in which a guard is supposed to be placed at night to protect the treasures of Becket's shrine. Trinity chapel was built to receive the shrine; and the whole of this part of the choir from the screen eastward is the work of William the Englishman. The site of the shrine is shown by the marks worn in the stones by many generations of pilgrims. The curious mosaic pavement resembles that round the shrine of Edward the Confessor in Westminster Abbey. Near this site is the tomb of Edward the Black Prince (1376) and facing it is the tomb of Henry IV. and his consort, Joan of Navarre. The circular chapel at the E. end of the cathedral is known as Becket's Crown. Near is the tomb of Cardinal Pole, the last archbishop who acknowledged the supremacy of the pope. In the centre is the Purbeck marble 'Chair of Augustine.' Tradition has it that this was the throne on which the old kings of Kent were crowned and that it was given by Ethelbert to Augustine, from whom it descended to the archbishops of C. C. The most reliable authorities place it at the beginning of the thirteenth century. Here too is a memorial to Archbishop Temple whose grave is in the cloister garth. Opposite Becket's tomb is the chantry of Henry IV. (1435). Down the steps on the right hand is the chapel of St. Andrew, corresponding to that of St. Anselm on the other side of the choir, and one of the oldest parts of the building. The N.E. transept is chiefly notable as exhibiting the skill of William of Sens in adapting the work of Ernulf and Conrad in order to make it harmonise with his own choir. Scarcely any portion of the N.W. transept or chapel of the Martyrdom (of Becket) remains as it was at the time of the murder. It was much altered by Chillenden when rebuilding the nave. Chillenden also built the S.W. transept. Leading out of it is St. Michael's or the Warrior's chapel, in the Perpendicular style, interesting as containing the coffin of Stephen Langton, leader of the barons at Runnymede.

The *Crypt* is entered from the S. transept. The westward portion was built by Prior Ernulf in Anselm's time. It is one of the finest examples of Norman work in existence. The E. end or crypt of Trinity chapel was the work of William the Englishman. It is loftier than the

other portion and is notable for its Norman arcading. Here Becket's body was placed for fifty years before its translation into the shrine in Trinity chapel. Here also Henry II. did penance and was scourged by the church's representatives.

Exterior and Monastic Buildings.—It must be remembered that the cathedral, imposing as it is, formed only part of the old monastic settlement. The cloisters are on the N. side; they are 144 ft., square and were rebuilt by Chillenden at the same time as the nave, to which the tracery of the arches and the vaulting closely correspond. Parts of Lanfranc's earlier cloister may still be found. The N. wall has some beautiful Early Eng. arcading. From the N.W. corner of the cloister a splendid view of the great central tower or 'Bell Harry' is obtained. The chapter-house (Lanfranc's chapter-house) was rebuilt by Henry de Estria (1304). The lower portion of the wall arcades are his work. The roof and windows are the work of Chillenden and date back to 1400. The chapter-house was restored and reopened in 1897 as a memorial of the thirteenth century of the landing of St. Augustine. The W. window depicting historical events connected with Canterbury is a memorial to Dean Farrar.

The cathedral narrowly escaped destruction from air attack on Britain during the Second World War. But the structure was shaken, particularly on the night of May 31, 1942, when a number of buildings within the precincts were destroyed or severely damaged by high explosive and incendiary bombs, including the medieval school room, canonical houses, the deanery, and the King's School dining-hall. Of the cathedral itself only the library was totally destroyed, but the concussion which the fabric sustained made necessary a major work of restoration, plans for which were made in 1946. See R. Willis, *The Architectural History of Canterbury Cathedral*, 1845-69; C. R. S. Taylor, *The Story of Canterbury*, 1912; M. A. Babington, *Canterbury Cathedral*, 1948.

Cantharidæ, or *Meloidæ*, family of coleopterous insects in the div. Heteromera, known popularly as blister-beetles or oil-beetles. The species, of which about 1500 are classified, are subdivided into winged Cantharidæ, and wingless Meloidæ, and many of them are remarkable for their power of raising blisters when in contact with the skin. The term 'Sp. flies' is a commercial term. *Cantharis vesicatoria*, is the true Sp. fly. *C. vesicatoria* being known as blister beetle. *C. (or Lytta) vesicatoria*, occurs in Spain, France, Italy, and S. Russia, and has this property. Species of *Mylabris* yield the so-called China cantharides, the Telini 'fly' of India (*Mylabris cichorii*) giving twice as much cantharidin as the ordinary *C.* They are about three-quarters of an inch long, bright green in general colour, with legs and antennæ bluish-black. When touched they feign death and emit a penetrating odour. The larvæ feed on the roots of plants, but those of the *Sitaris humeralis* feed on the eggs of

a bee, while the young of *Epicauta vittata* live on the eggs of a locust. The drug called cantharides is prepared from the dried bodies of *C. vesicatoria*, and is used on account of its blistering properties.

Cantharus, the typical genus of a section of *Sparidæ*, or sea-breams, is to be found in the Mediterranean, the Atlantic, and off the coasts of Africa and India. The species lack molar and vomerine teeth, are carnivorous and edible. *C. lineatus* is known both as the black sea-bream and as old-wife.

Cantharus. Gk. two-handled, open-footed cup, but varying in size and form. Dedicated to Bacchus, whence anct. examples often show decoration with Bacchanalian scenes.

Cantho: 1. Dist., Lower Cochin China, on the Mekong, covering 830 sq. m. Rice largely cultivated. Pop. 310,000, mainly Annamites. 2. Cap. of the dist. on the W. arm of the Mekong, 43 m. from its mouth, is a busy riv. port.

Canticum (Lat. *canticum*, dimin. of *canticum*, a little song), book of the Heb. Scriptures, commonly known in Eng. as the Song of Solomon, or the Song of Songs, this latter being a translation through the Vulgate *Canticum Canticozum* of the original Heb. title. The book is a short erotic lyric on the subject of chaste love, arranged in dramatic form in a dialogue, as is apparent from changes of number and gender in the original. Its interpretation, since it seems to be considered that its place in the scriptural canon demands some secondary significance, is still disputed. It was first explained by the rabbis as an allegory of God and His people, and as such was admitted to the canon by the Massoretes. The early Christian theologians, such as Origen, made it refer to Christ and His Church. This view is still accepted in some quarters. Other symbolic interpretations have been brought forward, but it appears improbable that anything more than the literal meaning is really to be found in the book. There are two variants of this idea: the dramatic, held by Deitzsch and Ewald, which considers that Solomon, the Shulamite maiden, and, according to Ewald, the shepherd lover, are represented; and the lyrical, held by Karl Budde, which considers the book as a collection of peasant nuptial lyrics. In any case *C.* must be regarded as an exquisite example of Heb. poetry, full of feeling for nature and passionate description of pure and faithful love. The language of many portions is of great beauty. The date and author of the book are hypothetical, but internal evidence tends to place it not earlier than the third century B.C. See S. R. Driver, *Introduction to the Literature of the Old Testament*, 1891; J. W. Rothstein, in J. Hastings's *Dictionary of the Bible*, 1898; T. K. Cheyne's article in the *Encyclopædia Biblica*, 1889-1903; and the works of Herder, Umbreit, Magnus, Hitzig, etc.

Cantigny, Battle of, battle of the First World War; the first independent operation of Amer. troops after the U.S.A. entered the war. The 1st Div., about

30,000 strong, took over the Montdidier sector from the 45th Fr. African Div. of shock troops. Facing them in a salient of which C. was the main feature, was the Seventh Ger. Army, under Gen. von Bochn. On May 28, 1918, the Amers. attacked after a two hours' bombardment, and with splendid dash reached their objective, advancing one mile. The 28th regular U.S. Infantry then stormed its way up the hill on which C. village was situated, took it and a number of prisoners, and beat off three Ger. counter attacks.

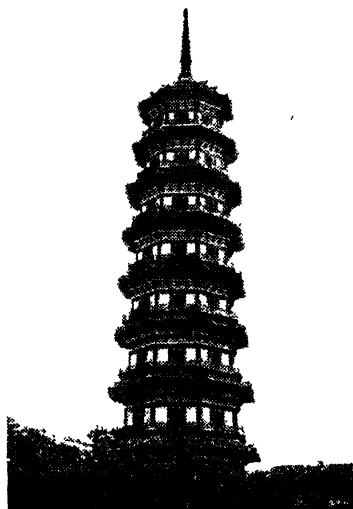
Cantilena, in music a term, almost synonymous with *cantabile* (*q.v.*) denoting smooth, melodious, and not rapid vocal writing, or performance in that style. The term also denotes in old church-song the plain or *canto-fermo* sung in unison by one or more persons to an organ accompaniment; and also the singing exercises in medieval music, in which were introduced all the intervals of the scale, etc.

Cantilever, originally a term applied in architecture to a structure supported only by one fixed base, beyond which it projects horizontally, *e.g.* a beam supported at the centre is said to have two C. arms. Cs. are largely used as supports for balconies and projecting portions of buildings, where they serve a double purpose of use and ornament; for sidewalks constructed outside the trusses of a bridge; and for the roofing of is. platforms at railway stations. Perhaps the most important use of the C. principle is its application to bridges. The idea has been applied to the bridging of spaces too wide to be crossed by a single plank from the earliest times, and, in its simplest form, is still employed by many E. nations. In these primitive C. bridges, two planks, firmly fixed in the banks, project over the stream, and are connected by an independent truss overlapping the end of each. The principle has recently been greatly developed, and applied in cases where girders or suspension bridges are impracticable. The modern practice is to erect in the bed of the riv., at a convenient and equal distance from each bank, a pier supporting two C. arms, one of which extends to the shore and the other over the stream. These outer ends are connected by another truss. The first modern bridge erected on these lines was one over the Niagara R., designed by Charles C. Schneider in 1882; and another famous example is the Forth bridge, Scotland, with its two great C. spans of 1760 ft. The Cs. of the Lansdowne bridge over the Indus at Sukkur are supported by the bank itself. The bending stress of a C. causes it to bend with a convex curve upwards, in the opposite direction to the curve of a bridge supported at both ends. See also BRIDGE.

Cantire, see KINTYRE.

Canto Fermo, the simple, unadorned melody of the anct. hymns and chants of the Church (often used in eighteenth-century literature synonymously with 'plainsong'). Also denotes any simple subject of the same character to which counterpart is added. See also CANTILENA.

Canton, cap. of the prov. of Kwantung, China, and one of the first cities in China. It stands on a riv., almost on the seaboard, 90 m. N.W. of Hong Kong. Until recent years it was surrounded by walls, and has narrow, crooked streets. A great part of the pop. live in boats on the riv. A municipal council was estab. in 1918, and demolished the old city wall, replacing it by a motor road 6 m. long. C. has now four parks. The entire circuit of the city is 10 m. Its mint formerly issued coins, all bearing a picture of Dr. Sun Yat-sen. Owing to labour troubles and excessive taxation, many factories



E.N.A.

THE GREAT PAGODA, CANTON

moved to Hong Kong or Macao, but there are factories and sev. hundred workshops for producing hosiery, matches, silk, porcelain, metal goods, and fancy goods. Its exports included tea, silk, and cassia, but how far its commerce and industries have been affected by the Jap. occupation is not known. There are numerous temples (chiefly Buddhist), pagodas, and many curio shops, a Rom. Catholic cathedral, a Church of England church, and a masonic hall. The new premises of the Hong Kong and Shanghai Banking Corporation cost half a million dollars in 1921. Sev. lines of railway start from C., but few have reached their intended termini. The trade of the port always tended to expand in spite of strikes, boycotts, high taxation, and constant political upheavals. The pop. has been estimated at 2,500,000 by the customs authorities, but more conservative estimates put it at between 800,000 and 900,000. From 1917 there has been much turmoil and fighting at C.

In 1924 £4,000,000 worth of damage was done while Dr. Sun Yat-sen was suppressing the Merchants' Volunteer Corps. In 1925 the foreign concession, Shameen, was besieged for four months. An attempt to estab. a Communist regime in Dec. 1927 was crushed after three days, but only after many lives were lost and much damage done to property. An administration was then set up known as the S. China Gov., which for the next ten years acted in semi-independence of the central gov. at Nanking. C. was the centre of the nationalist spirit in China, and was the base of the republican revolutionary movement. Dr. Sun Yat-sen being himself a Cantonese. For this reason the Jap. encountered stiff resistance in C. during their invasion of China, but after a period of severe bombing the city fell to the Jap. on Oct. 21, 1938, and remained in their hands until the end of the Second World War. The centre of the city was reduced to ashes, and large areas, including industrial works, were demolished by the Chinese army before their retreat from the city. While in the possession of the Jap., C. was subjected to further bombing by the U.S. Air Force at intervals during 1942-45. There were anti-Brit. riots in C. in Jan. 1948 during which the Brit. Consulate was destroyed. The riots arose out of demonstrations resulting from the eviction by the Brit. authorities of some 2000 Chinese 'squatters' in Kowloon.

Canton: 1. Co. seat of Stark co., Ohio, U.S.A., 52 m. from Cleveland; a great number of different articles are manufactured there. Potter's clay, coal, and limestone are exported. It was the home of President McKinley. Pop. 108,000. 2. Tn. of Fulton co., Illinois, U.S.A., 24 m. from Peoria, in a coal dist. There are large tobacco factories and flour-mills, and agric. implements are made there. Pop. 11,000. 3. Co. seat of St. Lawrence co., New York, U.S.A., 18 m. from Ogdensburg on the R. la Grasse. St. Lawrence Univ. is situated here. Butter and cheese are made, and small boats and launches are built. Pop. 5000. 4. City in Norfolk co., Massachusetts, U.S.A. Pop. 6000.

Canton: 1. Geographical area in Switzerland, having its own laws and a local gov. which looks after all domestic affairs such as taxation and control of public money. Foreign policy, control of the army, etc., are left to the central gov., whose headquarters are at Berne. 2. In France a term meaning a subdivision of the arron. under a justice of the peace.

Canton, John (1718-72), Eng. scientist, b. at Stroud; spent most of his life in London, part of the time as a school teacher. His researches in physics were mainly in the field of electricity, for discoveries in which he was made a fellow of the Royal Society about 1750. Among his other work may be mentioned the invention of the pith-ball electrometer, the verification of Franklin's identification of lightning and electric fluid, and his demonstration of the compressibility of water, for which he received the gold

medal of the Royal Society. He wrote sev. treatises in the *Philosophical Transactions*. See also CANTON'S PHOSPHORUS.

Cantoni, Simone (d. 1818), It. architect, b. at Maggio; studied at Rome, and spent most of his life at Milan, where he erected the Palazzo Sorbelloni, the Palazzo Mellerio, and other fine mansions. He was also responsible for the rebuilding of the great council hall in the palace of the duke of Genoa, which had been burnt down in 1770, and for sev. palaces in Como and Bergamo.

Cantonments, military term applied to a temporary resting-place for troops. On active service, troops in C. are quartered actually in a tn. or vil., and the term is also used when they are detached and quartered in sev. neighbouring tns. The most common use of the word was in relation to military settlements in Brit. India, where C. were equivalent to permanent barracks, situated at a short distance from a tn., or to isolated military stations. See also BILLITING.

Canton River (Chinese Chukiang, peari riv.), arm of the delta Sikiang in the prov. of Kwangtung, China. It is the lower portion of the Pekiang R. About 45 m. below C. the riv. is called Boca Tigris, or Tiger's Mouth. The estuary of the riv. S. of Boca Tigris is called Outer Waters. The celebrated Bogus Forts, taken by the Eng. in 1841 and 1856, guard the entrance to this part of the riv.

Canton's Phosphorus, form of calcium sulphide which, after exposure to sunlight, itself emits light for some time. Pure sulphide (CaS) does not show the same property. It was discovered by John Canton (q.v.) in 1768 by heating oyster shells with sulphur.

Cantor, Georg (1845-1918), Ger. mathematician, b. at St. Petersburg (Leningrad) and educated at Berlin and Göttingen. Prof. of mathematics at the univ. of Halle. C. created a new field of mathematical investigation and in the application of his deductions to analysis, and in some measure also to geometry, he provided a powerful instrument for dealing with the foundations of mathematics and for stating the inevitable limitations to which so many mathematical results are liable. In 1870 he solved the question of the uniqueness of the representation of a function by Fourier's series. His chief work is *Contributions to the Founding of the Theory of Transfinite Numbers* (pub. in London and Chicago in 1915), in which he developed the theory of sets of points. For his research in pure mathematics he was awarded the Sylvester medal in 1904. D. at Halle.

Cantor, in architecture, the N. side of a choir on which the cantor or precentor sits facing the Dean. From the fact that the precentor sits opposite the dean, the two sides of the choir are named Decani (i.e. 'of the Dean') and C. (i.e. 'of the Precentor'). It is often distinguished by its desk and raised seat.

Cantu, tn. in Lombardy, Italy, 5 m. S.S.E. of Como, with furniture manufacturing. It produces cereals and silk. Pop. 15,000.

Cantù, Cesare (1807-95), It. historian and novelist, b. at Brivio near Milan. He was a prof. of It. literature and language at Como, Milan, and Sondrio. He was thrown into prison between 1832 and 1833 for remarks made against the policy of the Austrian Gov. In his book *Ragionamenti sulla Storia Lombarda nel Secolo XVII*. While in prison he wrote his historical novel *Margherita Pusterla*, pub. in 1838. His great work is his *Storia Universale* (1836-42) in 35 vols., which brought him in £12,000 in royalties. It is of value both from a literary and a polemical point of view. His books for young people are *Letture Giovanili* and *Il Galantuomo*. Among his other works are *Storia degli Italiani* (1855-57), which is in 6 vols., and *Italiani Illustri, Ritratti* (1870-72), in 3 vols.

Canuck, popular term in the U.S.A. for all inhab. of Canada. In the dominion itself it is more often applied to the Fr. Canadians. The word is supposed to be of Indian origin.

Canute (Cnut) the Great (d. 1036), second king of Denmark of his name, and king of England. The son of Sweyn, king of Denmark, who, after conquering a great part of England, and driving Ethelred, the Saxon king, into exile in Normandy, d. in 1014. C. succeeded to his Eng. conquests, defeated Ethelred, who had returned, and overran the whole country with the exception of London, where Ethelred retired and d. in 1016. His son, Edmund Ironside, vigorously opposed C., but after being defeated at the battle of Assandun, consented to a div. of the country, by which he took Wessex and C. Mercia and the N. In 1017 Edmund was murdered and C. became king of England. He banished the sons of Edmund, married Emma, the widow of Ethelred, and divided the kingdom into the earldoms of Mercia, Northumberland, Wessex, and E. Anglia. He gained the favour of his people by sending back many of his adventurers to Denmark, placing Saxons in power, and by his general prudent policy and piety, and was accompanied by Saxon warriors on his expeditions against Sweden and Norway. He became king of Denmark in 1018, and of Norway in 1030. C. d. at Shaftesbury, leaving three sons, Sweyn, Harold, and Hardicanute. The story of his rebuke to his flattering courtiers comes from Henry of Huntingdon. See A. Olrik, *Viking Civilisation*, 1930.

Canvas, heavy, strong cloth, made of jute, hemp, or flax. The strands or fibres are woven in exactly the same way as in linen. Although the C. used for sailcloth is sometimes made from hemp and other fibres, the best and strongest kinds are made from flax, and generally in widths of 24 in. A piece, or bolt, is 40 yds. long. There are different kinds of C., varying according to weight. Artists' C., used for oil paintings, is one of the finest kinds of C., and the sails of racing yachts are often cotton-duck. The term C. is also used to denote a coarse type of plain cloth having hard twisted yarns.

Canvassing, term used for soliciting

votes at an election. It is also applied to the soliciting of trade or business by commercial travellers. In order to gain votes it was a practice to use illegal methods whereby the number of votes could be increased. The illegal methods adopted were such as treating, undue influence, and aiding and abetting on the part of the canvassers, and it was to cope with these irregularities that a law was passed against 'Corrupt and Illegal Practices.'

Canvey, is. in the Thames estuary, off the Essex coast, 30 m. E. of London. It has an area of 7 sq. m. It was reclaimed from the sea in the seventeenth century. It is reached by rail, the station being at Benfleet, with which it is connected by a bridge and also at low tide, by a causeway. Pop. 3600.

Canyon (Sp. *cañon*, a gorge), deep and narrow valley or gorge which has been cut by the action of a riv. In Colorado the Grand C. is a most perfect and beautiful example of this natural formation of the earth's surface. The riv. here has carved its way through solid rock, in parts to the depth of 6000 ft. and not a mile in width. The walls are of sandstone and limestone with varying colours, quite bare of vegetation, and also cut into buttresses and terraces by the action of the atmosphere. There are other causes for these deep cuttings besides the work done by the stream itself; one is the continual uplifting process which maintains the rapid flow of the riv., and the other the dry climate which keeps the rocky walls from being crumbled away by frost and springs. At Niagara there is also a fine gorge below the falls, due to erosion by the water in a 'young' land.

Canzone, form of poetry used principally for love lyrics, though occasionally for religious and other subjects. The earliest specimens from Provence date from the twelfth century, and those of Italy from the thirteenth century. The number of stanzas was generally five or six, but they varied sometimes, and the last stanza was often shorter than the others. In Provençal Cs. the same set of rhymes went through all the stanzas, but in the It. a fresh set was introduced for each stanza. Dante, Petrarch, Tasso, and Leopardi all wrote this form of poetry. Drummond of Hawthornden wrote the best examples of Eng. C.

Canzonet (dimin. of *canzone*), in music, applied to a short song in parts, and to musical settings of trifling verses.

Cão, Diago, see CAM.

Caobang: 1. Dist. in Tongking, covering an area of 3000 sq. m. The country is mountainous, and sulphate of tin, iron, and galena are found there. There are also fine forests. Pop. 70,000. 2. Cap. of above dist., 72 m. from Langson. Rice, maize, sugar cane, and betel-nut are grown there. Pop. 6000.

Caoutchouc, see RUBBER.

Capablanca, José Raoul (1888-1943), Cuban chess player and diplomat. b. in Havana. At the age of twelve he won a formal match against the chess champion of Cuba. Graduated at Columbia Univ., New York. In 1909 he beat Frank

Marshall, the chess champion of the U.S.A., and, in 1911, took the first prize at the international tournament at San Sebastian. Financial disagreement postponed his meeting with Dr. Emanuel Lasker for the world's championship for nine years, but in the intervening period the two met as competitors in the St. Petersburg tournament, when Lasker won by half a point. At Cuba in 1920 he at length met and defeated Lasker easily, Lasker complaining of the climate. C. held the championship from 1921 to 1927, losing it at the first challenge to Dr. Alekhine—he won 3, lost 6, and drew 25 games but dictated the style of the play. He continued to win remarkable victories, including his win over Dr. Kuwe in 1931 and tie with Botvinnik—5 points ahead of Lasker in the Moscow tournament of 1935. The characteristics of his play were simplicity, mathematical exactitude, and a perfect sense of timing. Wrote two admirable text-books in Eng.: *Chess Fundamentals*, 1922, and *A Chess Primer*, 1935.

Capacity, in law, means competency or ability to do any legal act or hold any office, and the state of possessing the necessary discretion to be chargeable for one's crimes. In the law of contracts, e.g., lunatics and infants are, generally speaking, incapable of entering into binding contracts. In criminal law children under seven are absolutely incapable of committing a crime. Between seven and fourteen the infant is still presumed to be *doli incapax*, but the presumption may be rebutted by evidence of discretion in the infant.

Capacity, power of containing a quantity. *Cubic C.*, the number of units of volume in a solid or closed space. *C. for heat*, the amount of heat required to raise the temp. of a body one degree. *Electrical C.*, the quantity of electricity required to raise the potential of a conductor from 0 to 1.

Capacity, Measure of, *see under* WEIGHTS AND MEASURES.

Capaneus, Gk. hero who took part in the first expedition of the Seven against Thebes. While he was trying to scale the walls of Thebes he was struck by lightning by Zeus.

Capanori, large commune in the prov. of Lucca, Italy. Pop. 46,000.

Cape Breton Island, rocky is. at the E. extremity of Nova Scotia, Canada; separated from the mainland by the Gut of Canso, 1 m. broad. The greatest length of the is. is 110 m., the greatest width 85 m., and the area 3120 sq. m. It is bisected by the waterway formed by the inlet of the Bras d'Or, on the E. coast, the lake into which it widens, and the St. Peter's Ship Canal, which joins this lake to the Gut of Canso. The Bras d'Or lake is 50 m. long, 20 m. broad, and from 12 to 60 fathoms deep. It is surrounded by beautiful scenery, and renders practically the entire is. accessible by water. The N. portion of the is. is much more mountainous and rugged than the S., and rises to an elevation of 1800 ft. at N. Cape. The coast is deeply indented by numerous

bays and harbours. The climate is milder than that of the mainland, but very moist. The harbours are open all the year round. A certain amount of grain is grown, and there is considerable mineral wealth, coal and iron (in the Sydney dist.), copper, marble, granite, limestone, slate, gypsum, and salt being mined and exported. Timbering and shipbuilding form an important industry, and C. B. is the centre of the cod fisheries. The is. is a great tourist resort. The pop. of N. C. B. is mainly of Scottish highland descent, and Rom. Catholic by religion. Gaelic is still largely spoken. In the mining dists. there are many Irish and Its. There are also some Fr. Acadians and Micmac Indians. The is. is divided into four cos.: Richmond, Inverness, Victoria, and C. B. The chief tns. are Sydney, Arichat, Port Hood, and Louisbourg. C. B. was ceded to France in 1654 at the peace of St. Germain; the Fr. settled and fortified Louisbourg in 1712-13. The is. was frequently taken and lost by Great Britain, but finally became Brit. in 1763. It was made a separate prov. in 1784 with Sydney as cap., but in 1820 it was annexed to Nova Scotia. Over 3,000,000 tons of coal are now shipped yearly. Pop. 150,000. *See* A. C. Walworth, *Cape Breton: Isle of Romance*, 1947.

Cape Coast, tn. on the W. coast of Africa in the colony of Gold Coast. Formerly the cap. There is a large trade in palm oil. Pop. 19,000.

Cape Cod, L-shaped sandy peninsula of Massachusetts, U.S.A., 65 m. long and 1½ m. broad. It is a favourite summer resort, and there are numerous small vils. and settlements.

Cape Colony, *see* CAPE OF GOOD HOPE PROVINCE.

Cape Fear River, N. Carolina, U.S.A., formed by the junction of the Deep and Haw Rs., enters the Atlantic at Cape Fear, 20 m. S. of Wilmington.

Capefigue, Jean Baptiste Honoré Raymond (1802-72), Fr. historian, antiquary, and politician, b. at Marseilles. His works are still read for their vivacious and picturesque style, but they are neither very deep nor accurate. Their number extends to well over 100 vols., and includes *Histoire de Philippe-Auguste* (1829); *Histoire de la Restauration* (1831-33); *Richelieu*, *Mazarin*, *et la Fronde* (1835-1836); *Philippe d'Orléans, régent de France* (1838); and *La Ligue* (3rd ed., 1843).

Cape Flights. The continent of Africa is particularly well adapted for air transport. Not only is it populous, a factor making for economic work, but it possesses a climate not given to great extremes, both its N. and S. extremities being sub-tropical. For this reason flying is possible throughout almost the entire year, Africa being perhaps the best of any continent for aviation. These advantages, combined with the fact that its vast distances have been little opened up by rail, early attracted the attention of the pioneers of civil aviation. The following is a brief account of the earlier flights from England to the Cape, which 'blazed the trail' for

the commercial services which have since followed.

The first attempt to fly the Cape from England, made in the early part of 1920, ended in a creditable failure, the Vickers-Vimy machine of Capt. Cockerill and Broome crashing at Tabora, Tanganyika. They, however, covered a distance of 2700 m. in 36½ hrs. and thus showed that the complete flight to the Cape was a possibility. The African section of this flight had begun at Heliopolis, Cairo's aerodrome, on Feb. 6. On the 22nd of the same month another Vickers-Vimy machine, the *Silver Queen II*, started from Cairo on the same quest. The pilots were S. Africans, Col. Van Ryneveld and Fl.-Lt. Brand. Bulawayo, the cap. of Rhodesia, was reached in 13 days, an air distance of 3880 m. Here the machine crashed, but the journey to Cape Town was continued in a new machine, a de Havilland. The whole flight was accomplished in exactly four weeks.

Next the Imperial Airways Company of Great Britain decided to survey the Cairo-Cape route and chose the well-known aviator Alan J. Cobham (later Sir Alan Cobham) for this task. He used a de Havilland machine, with air-cooled engines, more suitable for tropical flying. He was not attempting to break records, of course, and his flight was a leisurely affair. On Nov. 16, 1925, he set out, and arrived at Cape Town, in the same machine, on Feb. 17, 1926, covering a distance of 8500 m. in about 94 hours of flying time. Turning back after a few days' rest, he decided to try a quick flight home. He left Cape Town on Feb. 26 and arrived at Cairo on March 7. The total distance this time was 5500 m., accomplished in 9½ days, and the remaining distance to London was done in 4 days more. In 1930, the Fokker machine of the late duchess of Bedford, piloted by Capt. Barnard, with the duchess as passenger, did the London-Cape Town and back flight of 18,800 m. in 20 days. The chief C. F. since then are: 1932—J. A. Mollison, England to Cape Town, 4 days 17 hrs. 30 min.; Amy Johnson, solo flight from Lympne to Cape Town 6250 m., in 4 days 6 hrs. 54 min., and back to Croydon, 6200 m., in 7 days 7 hrs. 5 min.; 1933—Sqdn.-Ldr. Gayford and Fl.-Lt. Nicholls, Cranwell to Walvis Bay, 5341 m., in 2 days 9 hrs. 25 min.; 1936—Fl.-Lt. Rose, Lympne to Cape Town in 3 days 17 hrs. 31 min.; return flight in 6 days 6 hrs. 57 min.; Amy Johnson, Gravesend to Cape Town, 6400 m., in 3 days 6 hrs. 25 min.; back to Croydon, 7885 m., in 4 days 16 hrs. 17 min.; 1937—F./O. Clouston and Mr. Kirby Green, Croydon to Cape Town, 6870 m., in 1 day 21 hrs. 6 min.; back to Croydon, 7135 m., in 2 days 9 hrs. 23 min.; 1938—Capt. D. C. T. Bennett and First Officer Harvey in seaplane *Mercury*, launched pick-a-back from Malta, flew 6045 m. in 42 hrs. 6 min., namely from Dundee to the mouth of the Orange R. (while attempting a non-stop flight to Cape Town (6340 m.)); their average speed

being 144 m.p.h. An R.A.F. Lancaster Arles flew from Britain to Cape Town in 1946 in 32 hrs. 21 min. An R.A.F. Mosquito piloted by Sqdn.-Ldr. H. B. Martin, with Sqdn. Ldr. E. B. Sismore as navigator, reached Cape Town at 5.35 p.m. May 1 (1947) having flown from London in 21 hrs. 29 mins. This beat the previous official solo record from London (Alex Henshaw's, set up in 1939) by 17 hrs. 56 min.; and the dual record set up by F./O. Clouston and Mrs. Kirby Green by 23 hrs. 37 min.

Cape Golden Mole, see **CHRYSOCHLORIDÆ**.

Cape Henry, Action off. The Brit. in 1781 occupied Portsmouth on the James R. in Chesapeake Bay, N. America, and the Fr. squadron at Newport, Rhode Is., proceeded thither under the command of Commodore des Touches. He was met by Vice-Adm. Marriot Arbuthnot off C. H. on March 16. A fight followed which was indecisive, the Fr. losing heavily. The result of the battle was that the Eng. once more gained command of Chesapeake Bay.

Cape Horn, headland on a small is. of the Fuegian Archipelago, forming the southernmost point of S. America. It was sighted by Drake in 1578, and named by the Dutch in 1616.

Cape Hunting-dog, see **HYÆNA DOG**.

Capek, Karel (1890-1939), Czech author and playwright, b. at Malé Svatonovice, Bohemia. Became famous in 1920 by his play *Rossum's Universal Robots* (or *R.U.R.*), which added a new word to the world's vocabulary, a robot being an automatic servant or workman. Another successful play of his was *The Macropulos Secret*; and in two others he collaborated with his brother Josef—*Adam the Creator* and *The Life of the Insects*. His last play, *Power and Glory (The White Scourge)*, is anti-war propaganda and was performed in London in 1938. His reputation as a dramatist gave wide circulation to his novels, which show traces of the influence of H. G. Wells, especially *The Factory of the Absolute*, *Krakatit*, and the clever satire *War with the Neutts* (1937). In fiction he wrote a trilogy forming a convincing picture of Slav peasant life: *Hordubal* (1934), *Meleor* (1935), and *An Ordinary Life* (1936). His other publications include travel books: *Letters from Italy* (1923) and *Letters from England* (1926), a witty description of Eng. life; *Travels in the North* (self-illustrated) (1939) short stories, essays, and fairy tales; *Money* (1929), *Tales from Two Pockets* (1932), *Fairy Tales* (1933), *The Stolen Cactus* (1937), and *The Gardener's Year* (illustrated by his brother, 1929). His stories are often very poignant and many have been trans. into Eng. In *President Masaryk tells his Story* (1929-31) (Eng. ed. 1934) he records his appreciation of the statesman whose liberalism he fully shared. C. was Czechoslovakia's most outstanding author. See O. Elton, in *Essays and Addresses*, 1939.

Capel, Arthur, first Baron Capel of Hadham (c. 1610-49), Royalist soldier, member of the Short and of the Long Parliament.

He acted as the king's lieutenant-general in Cheshire and N. Wales. He accompanied the queen to Paris in 1646, and helped Charles to escape from Hampton Court in the following year. With Sir Charles Lucas and others, he gallantly defended Chester, but was obliged to surrender in 1645. He was imprisoned in the Tower, escaped, and was re-arrested, tried, and beheaded.

Capel, Arthur, Earl of Essex (1631-83), Brit. diplomat. He fought for the king in the Civil war, and, on the accession of Charles II., was appointed lord-lieutenant of Hertfordshire. He was sent as ambas. to Denmark (1670) and made lord-lieutenant of Ireland. He opposed the court party and supported the Exclusion Bill. He took part in the Monmouth conspiracy (1682), for which he was committed to the Tower, where he was found with his throat cut.

Capell, Edward (1713-81), Eng. Shakespearean critic, b. at Troston Hall, near Bury St. Edmunds; lived mainly in Hastings and London, where he was deputy-inspector of plays. His ed. of Shakespeare in 10 vols. with introduction, appeared in 1767-68. The complete ed. in 3 vols. of his *Notes and Various Readings to Shakespeare* was first pub. after his death in 1783. The first portion, consisting of notes to nine plays together with the glossary, had appeared in 1771 but had been withdrawn; the first vol. was printed in 1779, the second in 1780, but pub. of both was held up. The third vol., *The School of Shakespeare* was pub. in 1783.

Capella, or **Capra**, star of the first magnitude (0.2) in the constellation of Auriga, of which it is the brightest. In 1899 the astronomers, Campbell and Newall discovered it to consist of two sun-like bodies revolving round each other once in 104 days. The luminosity of C. is at least 100 times as great as that of the sun. Proper motion 44 in. a century.

Capella, **Martianus Mineus Felix**, Rom. writer living about the fifth century. His chief work was an encyclopædic compilation, being a medley of prose and verse, expounding the principles of the various liberal arts.

Cape May, city in C. M. co., New Jersey, U.S.A., on the Atlantic coast, 80 m. S.E. of Philadelphia. It is a favourite watering-place. It has glass works and canneries of vegetables and fruit. Pop. 3000.

Cape of Good Hope Province, or **Kaapland** (formerly **Cape Colony**), the most southerly portion of Africa, forming a prov. of the Union of S. Africa. It is named after the promontory on the S.W. coast discovered by Bartholomew Diaz in 1488 and named then Cape of Storms, but afterwards re-named Cape of Good Hope by the king of Portugal. The boundaries of the prov. are Bechuanaland Protectorate on the N., S.W. Africa, formerly Ger. S.W. Africa, on the N.W., and on the N.E. and E. the Transvaal, Orange Free State, Basutoland, and Natal. The breadth of the prov. may be measured by its diameters (N.E. to S.W. and N.W.

to S.E.), which are respectively 750 and 800 m. long. It comprises Brit. Bechuanaland and the extremity of the African continent S. of the Orange R., including the Transkei ter., and Natal. It is nearly twice the size of the United Kingdom. The total area is 277,170 sq. m. (the prov., 260,615 sq. m.; Transkei ter., 16,555 sq. m.).

Coastline.—The coastline from the mouth of the Umtamouba on the E. to the mouth of the Orange on the W. measures some 1300 m. The estuary of the Kynsna, on the S. coast, provides the only good natural harbour of the prov.; the bar at its entrance is never less than 1 ft. deep. Skirting the coast westward, the traveller will pass the mouths of many mt. torrents, broad stretches of forest, and the green slopes of mt. ranges. Further to the W. he will see Cape Agulhas and the Cape of Good Hope, which rises 840 ft. above sea level. If the traveller doubles the Cape, he will find himself in Table Bay, above which towers the flat-topped cloud-girt Table Mt. (3549 ft.). Cape Town, the cap. of the prov., extends along the coast and the lower slopes of the mt., on the side of the peninsula opposite False Bay, which lies on the S. So far the shore has been fertile and well watered, and the scenery often picturesque, but along the W. the coast is covered with white sand and scrub, and presents a barren aspect. Saldanha Bay, 20 m. N. of Dassen Is., is a safe and sheltered roadstead. Robben Is., outside Table Bay, is the only other is. of importance, and is fortified by the Brit. Gov. as a naval base.

Ocean Currents.—The Agulhas current rushes south-westward from the S. and E. coasts so forcibly that a counter-current, running in a north-easterly direction, is set up. Ships going towards Natal from Cape Town avail themselves of this back drift. At the S. extremity the warm Agulhas current meets the cold W. drift from the Antarctic. The current flowing northward along the W. shores is really part of this W. drift, though its course is diverted.

Rivers.—Beginning on the E. coast the Buffalo rises beyond King William's Town, which is on its bank. At its mouth lies E. London, the third port of the prov. Port Alfred is situated at the mouth of the Kowie, which rises in the Zuurberg Mts., and is noted for the beautiful country through which it flows. The source of the Kei is in the Stormberg. Further S., the Great Salt R. enters the sea. It is formed by the flowing of the Kat, which rises in the Winterberg, into the main stream, there called the Great Fish R. Rising in the Zuurberg, the latter, like the Sunday and the Groote, crosses the Great Karroo; it is remarkable alike for its swollen waters after rains, and for its tortuous course. At one time it makes a great circular sweep of 20 m., the two ends being less than 2 m. apart. The Sunday joins the Indian Ocean in Algoa Bay after watering a very fertile dist. The Groote is the more important of the two streams, which are known after their

junction as the Gamtoos. It takes its rise, like the Gamka, in the Neuwveld Range. The Gamka unites with the Olifants to form the Gouritz, which is fed by the trib., Groote (125 m.), just before it pierces the coast range. The most westerly riv. of importance on the S. coast is the Broedo, which rises in the Warm Bokkvelde. Breaking through the mts. at Mitchell's Pass, it afterwards receives the streams from the celebrated Hex R. Pass. On its banks are the picturesque cities of Ceres and Worcester. Unlike most of the rivs., whose mouths are silted by sand-bars, it is navigable for

weather they shrink to the size of brooks or dry up altogether.

Though the prov. has no lakes, there are many 'salt pans,' the largest being Commissioner's Salt Pan, some 20 m. in circumference. Situated in the barren N.W. flats, this natural basin, like the rest, rapidly loses its waters in the dry season, so that the salt layers at the bottom may be reached. Near Knysna and elsewhere are shallow basins, called *reieis*, which overflow into one another in time of flood. These pools vary in bulk according to the humidity of the atmosphere.



THE CAPE OF GOOD HOPE

some 35 m. There are three rivs. flowing into the Atlantic Ocean N. of Cape Town, namely, the Berg and the Buffalo, each 125 m. long, and between them the Olifants, 150 m., which, rising in the Winterhoek Mts. and cleaving a passage between the Cedarberg and Olifants chains, maintains a fair depth throughout its lower course. The great waterway of the Orange, which stretches almost from the Atlantic to the Indian Ocean, forms a N. boundary to the prov. The Zak, Ongers, and Brak unite with the middle courses of this riv., whilst the united Modder and Riet from the S.E. and the Harts from the N.E. both effect their junction with the Vaal, the greatest of the Orange offshoots, within the confines of the colony. The inner mt. range is the main watershed. Unfortunately hardly any of the rivs. are navigable for any distance. As they tear down the mt. sides, cutting deep ravines, they grow into splendid streams after heavy rainfall, but in the hot

Mountains and Tablelands.—For the most part the three mt. chains are well defined and their configuration is simple to grasp, since they follow the coastlines. Within the coast plain, which rarely rises to 600 ft., the abrupt S. slopes of the coast range ascend to a plateau some 30 m. wide, known as the Little Karroo (Hottentot for arid). The terraced formation is continued by the second chain of mts., which give on to the Great Karroo, a tableland whose area is something like 28,000 sq. m. The main belt of heights, shutting in this plateau to the N., fringes the immense plain of S. Africa, a strip of which only lies in this prov. Thus in spite of a perplexing nomenclature, the structure of the high lands is plain. Passing E. to W. the coastal chain is known successively as the Uitenhages, Langeberg, Zondereinde, Drakenstein, and Olifants Mts. The prov. E. of the Kei R. is very hilly, the S. portion being occupied by the Stormberg peaks and the N. by the flanks of the

lofty Drakensberg. The central range E. to W. includes the Zuurberg, Winterhoek, Grootte R., Grootte Zwartberg (greatest elevation 6989 ft.), and the Cedarberg Mts. Great gorges called kloofs have been pierced in this chain by the rushing streams. The third mt. rampart, running 120 m. inland from the shores, is variously named the Nieuwveld, Sneeuwberg (in which is Compass Berg, attaining the greatest altitude in the prov., 8500 ft.), Zuurberg, and Stormberg ranges. The E. coast is flanked by the Roggeveld and Komsberg Mts., which continue the Nieuwveld. It is true that the contours of the mts. are often imposing, yet these hardly compensate for the monotony of the bare stretches of veld, and for the marked deficiency in water and trees. The flowering shrubs and grasses have no sooner sprung up on the Bushmanland plateau (in the N.W.) than they are withered away by the hot suns, which undo the fertilising work of the heavy rains. Cattle, however, often find good pasture by the vleis, if the soil is not too brackish. The vast, treeless tableland to the N., whose average altitude is 3000 ft., is broken only by the great Orange R. which cuts across its whole length.

Geology.—The geological structure of the mt. ranges is fairly uniform, most of them consisting of huge masses of quartzose sandstones on granite bases. Whilst the granite when it occasionally crops out has rounded contours, the formation of the sandstone, as on Table Mt., is flat. The latter often covers the primitive rock to a thickness of 1750 ft. The Stormberg chain alone presents traces of recent volcanic action. Ferruginous reddish sands and argillaceous clays, resting on blue slaty rock, form the surfaces of the karroos and N. plateaux. The three systems are known as the Cretaceous, Karroo, and Cape systems, whilst there are also pre-Cape rocks that are little understood.

Climate.—The climate of the prov. is healthy. As a rule the air is remarkably dry and clear. The mean ann. temp. may be taken as less than 65° F., although the daily range is considerable, the average variation on the Karroo being as much as 27° F. The drawback is the prevalence everywhere of dust, which is blown by every wind. The climate mainly depends on two factors: the elevation of the land and the expanse of ocean in the lower hemisphere. It is the cold currents of the latter which give to Cape Town so low a mean temp. as 63° F., the same as that of the It. Riviera, which is 8° farther from the equator. The mt. chains exhaust the rains of the moisture-laden winds from the E. and S.E. Thus these winds fertilise in plenty the coast-lands, but, as the more they advance into the interior the drier they get, most of the prov. is subject to frequent drought. Along the W. coast, N. of the Olifants, rain does not fall for years together. A line from Walvis Bay to Port Elizabeth, on the S.E., roughly divides the prov. W. and E. into the

areas of winter and summer rainy seasons respectively. W. of 23° E. the mean ann. rainfall is under 10 in. By the W. coast and on the Little Karroo it varies from 10 to 20 in., but on the S. and S.E. coasts it is over 25 in., and in the Cape peninsula sometimes rises above 40 in. The thunder-showers, which usually follow the dry hot N. wind from the desert, are the one source of rainfall to the arid N. dists. Dec. and Jan. are the hottest months, and June and July the coldest. On the N. plateaux and on the Karroo the mean minimum temp. is 49° F., and the mean maximum 77°. Though the hot westerly winds make the daytime often oppressive, the nights are cool and refreshing. Frosts are frequent in the winter, and whilst snow rarely falls on the coasts, it often caps the high mts. for months together.

Flora.—Along the coast the flora is rich. Of the 10,000 varieties of species, some 450 are found only in the prov. Prickles and thorns are common characteristics of the plants. There are over 400 genera of the bush and heaths; the abundant pink rheinoster bush is not unlike heather. Aloes, 'everlasting flowers,' and the castor-oil plants are also indigenous. Among flowers the iris and arum lily are conspicuous, whilst the spurge plants, the elephant's foot, and the stapelia, or carrion flower, may be noted among plants structurally eccentric. Forests of trees rarely more than 30 ft. high cover some 550 sq. m. of the S. seaward slopes. The yellow-wood (of the yew species), the silver-tree, black ironwood, the melkhout, and the heavy, hard stinkhout are indigenous, whilst oaks, which grow luxuriantly, pines, and poplars have been introduced with success by settlers. Though the native fruits, including gourds, water-melons, and hard pears, are rare, most of the varieties introduced from other countries grow well. In the spring the blossoms of the dwarf mimosa on the Karroo are splendid. A coarse yellow grass covers the tablelands of the interior.

Fauna.—The fauna is varied, though lions and rhinoceroses have been expelled and the blaauwbok and quagga exterminated. Zebras, elands, antelopes, gnus, buffaloes, and elephants now require special protection. Not so the cheetahs and leopards, which, like other carnivora—the silver jackal, wild cats and dogs, aard-wolf, and hyena—are still fairly common. Springboks herd on the open veld, whilst other species of Ungulata are the steinbok, the klipspringer, and the dassie rabbit. There are also baboons, otters, pangolins and other ant-eaters, mongooses, jerboas, and hares. Among reptiles may be mentioned puff adders and other snakes, lizards, and tortoises. There is a great variety of game bird, including the ostrich, the huge kori bustard, the quail, teal, snipe, wildgeon, and many others. Eagles, falcons, owls, and aasvogels, besides flamingoes, pelicans, and cranes, are also found. Most of the birds belong to the Passeres order. Larks, weavers, and starlings—the Eng. starling

is the only naturalised European bird—are the commonest varieties. Of endemic insectivora, the 'golden mole' is notable for the splendid lustre of its yellow fur. Jumping shrews, tarantula spiders, scorpions, toads and frogs, and the poisonous tsetse fly are also native to the prov. The large baba and yellow-fish occur in fresh water, whilst in the sea are found seals, sharks, whales, steenbrass, snook, and many edible species.

Agriculture and Allied Industries.—Artificial irrigation is much needed to promote the cultivation of large tracts of land, whose one deficiency is water. Mealies (Indian corn), oats, wheat, barley, and rye yield good crops. The vegetable produce consists chiefly of potatoes, mangolds, peas, and beans. Most of the farmers live by sheep-rearing; the number of sheep in the prov. amounting to nearly 20,000,000; of cattle there are over 2,000,000, and of goats 3,500,000. The number of domesticated ostriches on the farms had declined in 1931 to about 100,000, showing a very considerable decrease since 1912, and the total to-day is much below that figure. Oudshoorn was, and still is, the great ostrich farming centre of S. Africa, but the industry was at its peak from 1906–12, when there were 400,000 birds in that dist. alone. By 1939 the number had dropped to fewer than 20,000, and feathers, which had previously sold at any price from £20 to £100 per lb., sold at no more than 22s. per lb. Mules are bred on the veld. In the W. dists. of the Cape, the vine is grown and produces an abundance unknown in other countries. There is only a limited demand for the Cape wines in Europe in spite of the fine flavour of the grapes. The export trade has, however, improved. The tobacco crop is becoming increasingly important, and cotton, also, is grown. Great improvements in transport have made it worth while for fruit-growers to cultivate grapes, apricots, oranges, and peaches for foreign markets. The ann. harvest of each fruit runs into millions, and S. Africa supplies the Brit. market with fruit of all kinds during the winter months. Great quantities of wheat and maize are annually ground in the flour-mills, which are second only in importance to the diamond mines as a source of industrial wealth.

Mining.—The diamond mining is carried on in Kimberley, which yields more diamonds than all the other mines combined. Hopetown, Griqualand W., and other places near the Orange R. Up to the end of 1938, the total value of diamonds mined in the prov. was over £225,000,000. The industry was severely hit by the First World War, when many of the mines closed down, and there was another serious slump in 1921. Diamond output is, however, now controlled by an agreement fixing quotas of members of the Diamond Producers Association. There are a number of collieries in the Stormberg dist., and copper, gold, tin, and salt are also found.

Trade.—The prin. exports are diamonds, gold, wool, ostrich feathers, hides, and maize, whilst textiles, foodstuffs, hard-

ware and machinery, iron and steel goods, paper, rubber, etc., are the staple imports. Since the Union of S. Africa came into effect, no complete record of the trade of the separate provs. has been kept, but it is estimated that the value of goods sent from the Cape to the United Kingdom has averaged annually some £14,000,000 in the past decade. Goods imported from the United Kingdom were valued at an equivalent amount. Transit of goods to and from the Transvaal and other parts of the Union considerably augments the commerce of the prov.

Posts and Telegraphs.—Besides a well-organised postal service, the prov. is connected with Europe by four distinct cable routes, is in complete telegraphic communication with all the S. African provs., and has estab. within her own boundaries an excellent telegraphic system under state control. The telephone service has been instituted in the tns. The prov. is also in wireless communication with the United Kingdom.

Railways.—The railways are for the most part owned by the state. The first was built in 1859 from Cape Town to Wellington as the result of private enterprise, but in 1871 Parliament began to construct railways at public expense. The Western, Midland, and Eastern are the three chief systems. Of the first system the main line runs from Cape Town through Kimberley, Vryburg, Mafeking, Bulawayo, and the Victoria Falls (1623 m.) on to the Belgian Congo frontier. Branch lines connect Cape Town with Johannesburg, Pretoria, Salisbury, and Beira (2037 m.). The terminus of the Midland system is Port Elizabeth. The main line passes through Cradock and Naauwpoort to Norval's Pont, and thence is continued to Bloemfontein, Johannesburg, and Pretoria. The Midland and Western systems are connected by branch lines at De Aar. The Eastern system runs from E. London to Springfontein (314 m.), which is a junction for the Bloemfontein railway. A series of railways crosses the prov., running E. and W. parallel to the coast. There is a total mileage in the prov. of over 5000 m.

Other Communications.—The W. route to the Cape is via London or Southampton to Cape Town, the E. is via the Suez Canal and Natal. There are steamer connections also with Australia and India, and Cape Town may also be reached by air. Wingfield airport being situated 6 m. from the city.

Races and Population.—Of the two indigenous tribes, the Bushmen (q.v.) and the Hottentots (q.v.), the former have retreated before the settlers and have been much reduced in number, and the latter are now nearly all half-breeds of Hottentot, Dutch, and Kaffir blood. The Kaffirs come from the Bantu negroid stock, their chief tribes being the Bechuana, who live N. of the Orange, and the Fingoes, Tembus, and Amaxosa. The Griquas are half-castes of Dutch-Hottentot blood. A number of Malays, whose bond of union is their Muslim religion, have settled round Cape Town. The

country is chiefly populated by Afrikaner (and Ger.) farmers who speak *taal*, a corrupt form of their own original tongue. Eng. is commonly spoken in the tns. In the 1936 census the European pop. numbered 791,600. By 1941 this pop. was estimated to have increased to 826,000. Of the non-European pop. (1936), 2,045,600 were Bantu, 10,500 Asiatic, and 682,000 mixed or other races. Notwithstanding the great numerical superiority of the coloured races, in the S.W. corner of the prov. the white pop. is actually numerically the stronger. Only a very small proportion of the people live any distance inland. The majority of the coloured pop. is engaged in agric. or domestic employment. Since early years there has been a steady stream of immigration. In 1903, after the Boer war, the number of immigrants was phenomenal, namely 61,870, that is, 30,000 more than the emigrants. But in 1905 the outgoing figures (34,533) were actually more than those of immigration (33,775), and the number of immigrants continues to be low.

Chief Towns.—The cap. of the prov. is Cape Town (*q.v.*). Kimberley (18,900) is the only inland tn. of importance. Port Elizabeth (64,700) and E. London (39,600) come next in importance to Cape Town as seaports. In the W. half of the prov. the chief tns. are Paarl (10,900), Mossel Bay (7000), Oudtshoorn (8100), Worcester (7200), George (7300), Graaff Reinet (4400), Cradock (3000), Middelburg (2000), and Caledon, Malmesbury, Wellington, Stellenbosch, Beaufort W. In the E. half the most important tns. are Uitenhage (11,000), Grahamstown (8900), Queens-town (8100), King William's Town (6100), Aliwal N. and Somerset E. Simons-town is a naval station with large docks. In each case where the pop. is given, it is the number of whites only. In the provincial cities, streets running at right angles are generally grouped round a central market place.

Religion.—Of the European pop. (in the 1936 census) the Dutch Churches claim 459,000 adherents and the Anglican Church 140,000. Other denominations: Methodists, 51,000; Rom. Catholics, 33,000; Presbyterian, 25,000; Baptists, 11,000; Lutherans, 11,000; Congregational, 5000; Christian unspecified, 22,000. There were 28,000 Jews, and 6500 unspecified.

Education.—There is a state system of free primary education, which is compulsory for white children. School boards and school committees conduct the local school administration, the prov. being divided into 111 school dists. There are special day and industrial schools for the natives. The elementary schools are undenominational. The chief univ. is that estab. in 1874 at the Cape. It was modelled on the London Univ.

Law.—The administration of justice is well systematised. What was the supreme court of the Cape became, like those which sit at Kimberley and Grahamstown, local divs. of the Supreme Court of S. Africa after the Act of 1909.

History.—The hist. of the prov. of the Cape of Good Hope falls easily into two sections, with 1814—the year when it was finally recognised as an Eng. colony—as the dividing line. Two Portuguese, Bartholomeu Diaz (in 1486) and Vasco da Gama (1498), were the first explorers to round the stormy Cape. Though from that time onward Portuguese, Dutch, and Eng. traders rarely went to the E. by the Cape route, the first definite step towards acquisition was taken by the Dutch E. India Company in 1652, when it estab. a fort at the foot of Table Bay, and made a small settlement, with the object of ensuring a fresh-water supply for their merchant vessels in their passage to the E. Indies. But the company was early induced to cultivate the fertile earth and to found a colony as well as a water station. Unfortunately, it did not encourage individual colonists to co-operate, with the result that the latter sent home many protests against its jealous monopolies—protests, however, which proved quite unavailing. When France seized Holland, the latter appealed to England for help. The effect of this at the Cape was that an Eng. force held the colony in trust for the mother country till the peace of Amiens (1810), when it was given back. After about four years' rule under stato administration, this time, instead of the company's, an Eng. force (about 4000 strong) was again landed in the colony to forestall any efforts the common enemy, France, might make to capture so prosperous a land. Gen. Janssens, the Dutch general, was obliged to capitulate. Thus, after a military occupation which extended over some years, the colony was recognised by the European powers as a Brit. possession. Once the company with its narrow, selfish ambitions was removed, agriculture and industries, especially sheep-rearing for wool, advanced by leaps and bounds. But in the course of its rapid development the colony encountered other disturbing forces. It happened that the native Kafir tribes were expanding southward at the same time that the colony was pushing N. The contact of Kafir and colonist led to a series of wars, the obvious cause of which was the cattle-lifting propensities and the predatory habits of the former. But the wars were really an expression of the inevitable conflict between tribal laws and European administration, a conflict which allowed of no settlement by compromise. The disastrous battles at last brought home to the Eng. Gov. the need of controlling native tns. by imperial administration. This was actually carried into effect by the Scanlen ministry. Paternal gov. of the natives outside the colony was substituted by the Uppington-Sprigg ministry. Jameson, who in 1896 made an unsuccessful raid into the Boer ter. of the Transvaal, was a doctor at Kimberley. The colony, especially Kimberley, played an important part in the S. African war (*q.v.*) (1899–1902), but the Cape rebellion ended early in 1900. Cecil Rhodes, who was president of the colony from 1890 to 1896, pursued an imperial

policy in sharp contrast to that of the Bond party. The latter, stimulated by the active encouragement of the famous Afrikaner Bond, hoped in vain to establish a Dutch republic. See SOUTH AFRICA, UNION OF.

Constitution.—The constitutional development of the colony was much more rapid than in the older countries. As in the first instance the governors of the colony were autocrats, it was a fortunate thing that many of them proved men of ability and public spirit. The first executive council was called in 1825, and ten years later the first legislative council, one half of which was nominated by the governor, the other by the Crown from its officials. In 1853, at the instance of the council and with Crown support, a House of Assembly and a Legislative Council were conceded to popular wish. Finally, responsible gov. was put altogether in the hands of the colony in 1872. As early as 1829 it was decreed that men of all nationalities were to enjoy alike the advantages of the common law, and every slave was emancipated in 1838. By the South Africa Act of 1909, the colony entered the Union of S. Africa, sending fifty-one representatives to the House of Assembly and eight to the Senate. Its former constitution was naturally revoked. A prov. council, elected for five years, consisting of sixty-one members, and presided over by an administrator appointed for five years by the governor-general, and an executive committee of four members, controls local taxation and all matters that concern the prov. only.

The Cape Native Franchise.—When in 1902 the Brit. Gov. annexed the Boer republics the terms offered included not only the promise of self-gov., but an assurance that no native franchise would be given until this had been attained. It was conceded, however, that political union implied a unified native policy, and a Native Affairs Commission, appointed in 1903, investigated (*inter alia*) the question of the franchise. The commission found that in the Cape there were 8117 registered native voters out of a total electorate of 135,168 and that in seven constituencies out of forty-six the native vote could determine the issue of an election. The commission concluded that this was a dangerous position and therefore proposed the creation in each colony of S. Africa of native constituencies in which Africans should vote separately from Europeans. In 1908-9 when the National Convention met to decide the Constitution of the Union the Cape delegation proposed a uniform franchise dependent upon a civilisation qualification, which would have admitted some natives, but the delegations from outside the Cape preferred the abolition of any native franchise. It was eventually decided to retain the then existing position the Cape franchise being 'outrenched' by the provision in the South Africa Act that it could be modified only by a two-thirds majority of both Houses of Parliament sitting together. The right of natives to sit in Parliament, which had been im-

plicitly theirs in the Cape, was now withdrawn. The question of the franchise was raised anew as an element in the policy of racial segregation when the Nationalist Party came into power in 1924 but a Bill for the abolition of the Cape franchise failed to secure a two-thirds majority. The attack on the native franchise (then 2/7 of the Cape electorate and 1/2 of the Union electorate) was renewed in 1934-35. The fact that the policy of segregation was already effective throughout the Union was a strong argument for the separation of the natives from the European electorate. The Representation of Natives Act passed in 1936 provided (*inter alia*) that the Cape and Transkei should be separately represented. The Act as originally introduced would have abolished the Cape native franchise but in its final form it made a compromise, it maintains the Cape native franchise but provides for separate election by the Cape native voters of three members of the House of Assembly and two members of the Prov. Council, who are additional to the existing members and hold office for five years irrespective of a dissolution. The next threat to the Cape franchise came in 1948 with the defeat of the Smuts Gov. by the Nationalists under Dr. Malan, when the new gov. threatened to make certain changes in both the coloured and native franchise by the ordinary process of legislation regardless of the entrenched clauses of the South Africa Act.

Consult: G. W. Stow, *The Native Races of South Africa*, 1905; S. Playne, *Cape Colony: its History, Commerce, Industries, etc.*, 1912; O. F. Mentzel, *Description of the Cape*, part I, 1921; part II, 1925; G. Botha, *Social Life in Cape Colony in the 18th Century*, 1927; W. M. MacMillan, *The Cape Colour Question*, 1927; A. W. Wells, *South Africa: a Planned Tour*, 1939, 1947; P. S. Du Toit, *Onderwys in Kaapland*, 1940.

Capercaillie (Capercallie, or Capercaillie are variants in spelling, the *c* being pronounced *y*), or *Tetrao urgallus*, species of grouse of the family Phasianidae, and is the largest gallinaceous bird of Europe. Also called wood-grouse, or cock of the woods, the latter a trans. of Gaelic *capull coill*. The C. is about the size of a turkey and resembles the blackcock in appearance and polygamous habit; the general colour of the male is blackish-grey above, black below, with dark green chest, while the female is smaller, mottled, and has a reddish breast barred with black. The feathers on the legs and feet are longest in winter time, and the toes are quite naked. At breeding-time the male indulges in curious love-songs and antics to attract a mate, and fights between rival cocks are of common occurrence. The food of the birds consists of insects, worms, berries, and young pine-shoots. The C. is widely distributed in countries where pine forests abound; at the end of the eighteenth century it was exterminated in Scotland, but in the middle of the nineteenth it was successfully reinstated. See J. G. Millais, *Game Birds*, 1892.

Cape River, otherwise known as *Coco*, *Segovia*, or *Wanks*, in Nicaragua. It forms the boundary between Nicaragua and Honduras. It is 300 m. long and flows into the Caribbean Sea. Navigable for 140 m., though its mouth is barred by a sandbank.

Capern, Edward (1819-94), Eng. poet, b. at Tiverton in Devonshire. He wrote sometimes under the pseudonym of 'The Rural Postman of Blideford.' *Ballads and Songs* was pub. in 1858; *Devonshire Melodist*, with music, in 1862; *Wayside Warbles* in 1865; and *Sun Gleams and Shadow Pearls* in 1881.

Capernaum, anct. city of Palestine, mentioned in the N.T. It is usually identified with the modern Tell Hum, on the N.W. coast of the sea of Galilee, but occasionally with Khan Minieh, a little further S.

Capers, see CAPPARIDACEÆ.

Cape Sable Island, situated at S. extremity of Nova Scotia. C. S. is the most southerly point.

Capesterre, or *Le Marigot*, tn. in Guadeloupe, Fr. W. Indies, 12 m. E.N.E. of Basse-Terre. Pop. 10,000.

Capet, family name of the third Frankish dynasty, founded by Hugh C. (q.v.). This family ruled France in a direct line from 987 to 1328, and through the collateral branches of Valois and Bourbon until the revolution in 1789.

Capet, Hugh (987-96), king of France, b. about 940, the son of Hughes the Great, count of Paris. In 987, at the death of Louis V., the last of the Carolingian line, he assumed the sovereignty of the whole of France, and founded the third, or Capetian, dynasty. He was accepted by most of the nobles, but his claim was contested by Charles of Lorraine, the rightful heir of Louis V., whom, however, he defeated. His rule was wise and moderate. He rallied the great nobles round him as grand vassals, and made feudalism a recognised part of the constitution. He also estab. hereditary succession to the monarchy, and made the king's eldest son 'master of the palace.' He was succeeded by his son Robert.

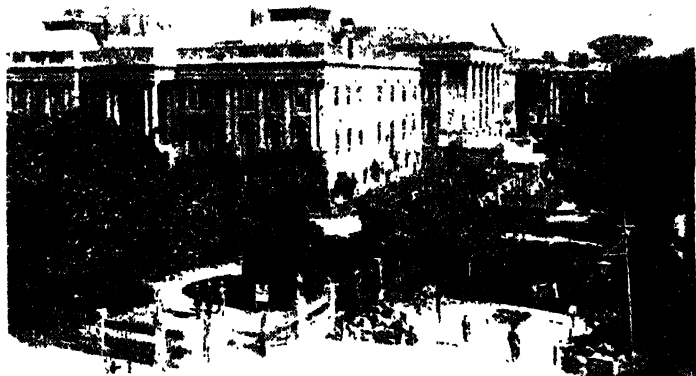
Cape to Cairo Railway. Cecil Rhodes evolved the scheme of running a railway right from end to end of the continent of Africa, traversing Brit. ter. as much as possible and acting thereby as a connecting link between all Brit. possessions in Africa. The distance between Cape Town and Cairo is about 5000 m. The first passenger train arrived at the Victoria Falls on June 22, 1904. At this spot the Zambezi R. is spanned by a steel cantilever bridge, which is 380 ft. above flood water, and the highest bridge in the world, the next highest being the Viaduct du Vianr in France, that being 375 ft. In the year 1910 the railroad from Cairo had reached Sennar, except for the riv. gap between Assouan and Wadi Halfa. This was a length of line about 1000 m. The line from the Cape had by 1906 reached Broken Hill, a length of 2017 m. The scheme has since resolved itself into a combined rail, road, and steamer route. The journey from Cairo to Khartoum is

made by rail, thence by steamer on the Nile to Juba, and from Juba by motor road to join the Cape railway either at Broken Hill through Nairobi and Livingstone or at Bukama in the Belgian Congo. The time taken for the complete journey varies from thirty to forty days.

Cape Town or *Kaapstaad*, seaport, the legislative cap. of the Union of S. Africa, seat of the Cape Prov. Council, and the metropolis of S. Africa; it is 5979 m. distant from Southampton (transit by mail steamship 13-16 days, and by air mail, 8 days). It is situated on the N. side of the Cape peninsula in the S.W. of the colony, on Table Bay, and at the foot of Table Mt., 30 m. N. of the Cape of Good Hope. The central portion lies in an amphitheatre, which extends down to Table Bay towards the N.E. and is backed on other sides by the precipitous face of Table Mt. (3580 ft.) and its outlying masses, Devil's Peak on the E., and Lion's Head and Signal Hill on the W. This part of the city is built on the slopes at the foot of these mts. and extending down to the shores of Table Bay. Table Bay is not a good natural harbour, being exposed to N. and N.W. gales, but a breakwater of 3640 ft. has been constructed to shelter shipping, and there are commodious wet docks, opened 1870, a dry dock, and a gov. patent ship with a lifting power of 1000 tons. The recently constructed outer harbour has a minimum depth of 27 ft. (new harbour fortifications are in process of construction). The tn. is the terminus of sev. railway lines. It was laid out after the Dutch fashion with geometrical precision, is well drained and paved, and has a good water supply coming from Table Mt., and an electric tram service and a suburban railway. The chief buildings are the two cathedrals, Anglican and Rom. Catholic; sev. Muslim mosques; the S. African College; the museum and public library (the gift of Sir George Grey); the observatory (1820), which is the finest in the S. hemisphere; the castle (a fort 400 years old); the Houses of Parliament; Government House; the buildings of the univ. of the Cape of Good Hope (1873), which is an examining body only, and is built on a splendid site on the Groote Schuur estate, Rondebosch; and the botanic gardens. The city hall can accommodate 6000 people and the Dutch Reformed Church, the earliest edifice for public worship in S. Africa, 3000. Since 1910 the Union Parliament has met in a new wing added to the original Houses of Parliament. The Gov. Gardens, containing a fine oak avenue, serve as a public park. Some fine old buildings of the Dutch period still survive, the chief being the castle, begun in 1666, and to-day the oldest building in S. Africa; and the Koopmans de Wet Museum, a Dutch house of the early eighteenth century, containing specimens of old Dutch furniture and antiques. C. T. has a modern and well-equipped aerodrome, Wingfield Airport, 6 m. from the centre of the city. There are numerous fine and populous

suburbs, including Green Point, Sea Point, Woodstock, Maitland, Mowbray, Rosebank, Rondebosch, Newlands, Claremont, and Wynberg. A chain of well-armed forts extends along the shores of Table Bay. The climate is somewhat similar to that of the Riviera, the mean ann. temp. being 62.3° F., Jan. 69.9° F., July 55.1° F., with a maximum of 102° F. and a minimum of 34° F. The mean ann. rainfall is 24.8 in. The city, which is an important port of call, was founded by the

possession of Portugal, in the Atlantic Ocean, off the W. coast of Africa, about 300 m. W. of Cape Verde. The is. may be divided into three groups: 1. The W. Windwards (Barlavento), comprising Santo Antão (246 sq. m.), São Vicente, Santa Luzia, São Nicolau, and the small is. named Branco, and Razo. 2. The E. Windwards, comprising Sal and Boa Vista. 3. The Leewards (Sotavento) comprising Malo, Santiago (São Thiago) (396 sq. m.), Fogo, Brava, Grande, and Bombo. The



CAPE TOWN: PARLIAMENT BUILDINGS

Dutch in 1652. It is perhaps the most beautifully situated city in the world. It has become a recognised health and holiday resort. The public library contains 150,000 vols. In the S. African Museum are a number of 'post office stones' beneath which captains of ships outward bound placed their letters for conveyance home. In the Jewish synagogue, which cost £40,000, is a memorial to local Jewish victims of the First World War. A striking war memorial and a memorial to Capt. Scott, who perished in the Antarctic, are near the entrance to the pier, which was completed in 1914 at a cost of £85,000 and is 1800 ft. in length. Total pop. (1936) 336,400; European 171,600 (1946, 214,201), and non-European 164,800. The rateable value, in 1980 £2,054,204, is now nearly £40,000,000.

Cape Verde, most westerly cape in Africa, situated in Senegal. It was discovered in 1443 by Nuno Tristão in the time of Henry the Navigator.

Cape Verde Islands, archipelago, in the

total area is about 1516 sq. m., and ten of the is., the chief being Santiago, São Antão, Fogo, Brava, and São Nicolau, are inhabited. The is. are all mountainous and largely of volcanic formation, but some anc. granites and gneisses point to a continental origin, and on some is., as Malo, there are sedimentary deposits. The main peaks are the volcano of Fogo (8800 ft.), which was active in 1847; the Pico da Antonia, on Santiago (7330 ft.); and the Pão de Açúcar, on Santo Antão (8000 ft.). The climate is tropical, though tempered by sea breezes. There is only a short rainy season in Aug. and Sept., and much distress and famine are caused by drought. The soil is not very fertile, and trees are especially rare, but coffee, sugar, Indian corn, beans, oranges, grapes, peanuts, cacao, cotton, tobacco, cinchona, and indigo are grown and exported. Iron is found in the S. is., and sev. have guano deposits, while salt, amber, archil, and red coral are also largely exported. Cattle-rearing is carried on, and the coasts abound

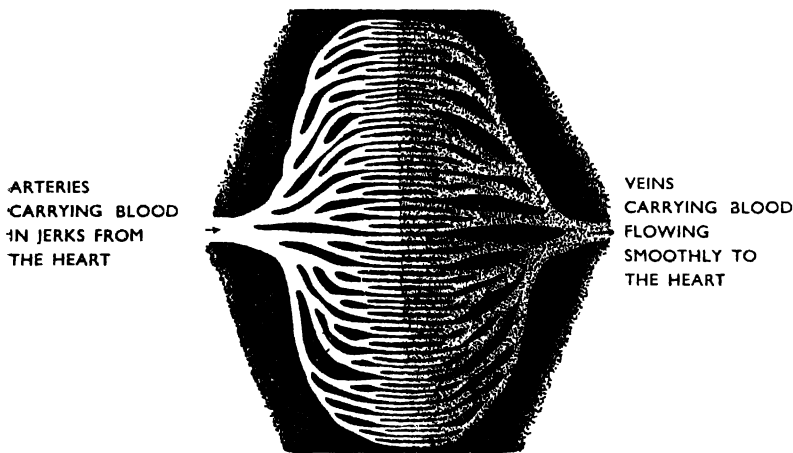
in turtles. The inhab., mainly Negroes and mulattoes, speak a debased Portuguese. Porto Grande, on São Vicente (20,000), is a coaling station. The cap. is Praia (6000). The Portuguese discovered the is. in 1441-56. Pop. 153,000 (mulattoes, 96,000; Negroes, 55,000). See A. Lyall, *Black and White Make Brown*, 1938.

Cape Wrath, most westerly point on the N. coast of Scotland, in the co. of Sutherland. It is one of a series of wild cliffs formed of gneiss, and is 300 ft. high.

a fine, or perform some other legal obligation. The writ of attachment for contempt has replaced the old C. for all practical purposes.

Capillaire, sort of syrup concocted from the maidenhair fern. It is used in medicine as a pectoral and sometimes as an astringent.

Capillarity (Lat. *capillaris*, pertaining to the hair), the phenomenon which occurs when a fine tube, open at both ends, is placed vertically in a liquid; the surface of the liquid within the tube is usually



CAPILLARY VESSELS

A diagram illustrating the change from arterial to venous systems in the network of capillaries.

Capgrave, John (1393-1464). Eng. theologian and historian. He was b. at Lynn and became an Augustinian friar. He wrote in Lat. Bible commentaries and *Nova Legenda Angliæ* in the year 1416. This was printed by Wynkyn de Worde, 1516, and is the only complete work of C.'s to have been printed. He also wrote *Vita Humfredi Ducis Glocestrie*. His chief Eng. works were *The Chronicle of England from the Creation to A.D. 1417*, and a metrical *Life of St. Catherine*.

Cap Haitien, tn. in the republic of Hayti, and an episcopal see, situated in a magnificent harbour 5 m. from Port au Prince. Under the Fr. gov. it was the cap. of Hayti. It is connected by cable with France, S. America, and San Domingo. In 1842 it was the scene of a terrible earthquake, and in 1865 the tn. suffered great damage through bombardment by the Brit. Pop. 20,000.

Capias (Lat., 'you may seize'), term once used in legal practice to denote writ directed to the sheriff, commanding him to arrest some person named in the writ to come up for judgment, discharge

either above or below the surface outside. The condition is only observed when the diameter is small, hence tubes which exhibit this property are called capillary or 'hair-like' tubes. A similar effect is produced when two glass plates are held vertical and parallel a short distance apart in a liquid; the liquid forms a film between the two plates. If the plates are pulled gently apart at one side so as to form a very acute angle, the surface of the contained film presents a curve (an equilateral hyperbola), having its greatest distance from the free surface of the liquid at the point of the angle. Thus C. diminishes as the distance between the walls increases, the ascent between smooth glass plates being, however, only one-half of the ascent in a tube of the same diameter. Every liquid has at its bounding surface between it and another medium (say air or glass) a surface tension, or tendency for the surface to withdraw itself into the smallest possible area. In small amounts of liquid, this tendency is sufficient to overcome the effects of gravity; thus a minute quantity of mer-

cury becomes on a flat surface a globule that is practically spherical, whilst a large amount simply shows a convexity at the edges, gravity having produced that horizontal surface which we look upon as characteristic of liquids. In the instances mentioned it should be noticed that there are three substances in contact, such as glass, air, and water, and the form taken by the visible fluid surface, i.e. that of the water, depends on the relative attracting power of the three substances on each other. Thus whilst water rises in a capillary tube and presents a concave surface upwards, mercury is depressed and has a convex surface. C. is a widespread phenomenon; oil rises in the wicks of lamps, moisture in the roots and stems of plants, by virtue of C. All substances with pores of sufficient size are capable of sucking up water, e.g. blotting paper, sponges. See ABSORPTION; SURFACE TENSION.

Capillary Vessels, smallest blood-vessels in the body. The arteries which convey blood from the heart are split up into myriads of branches which vary from a five-hundredth to three-thousandth part of an inch in diameter. By their means the blood is supplied to every part of the body, the flow depending on the direction of the central intelligence. The capillaries reunite in the veins, by means of which the impure blood is returned to the heart.

Capistrano, Giovanni di (1385-1456), It. theologian, b. at Capistrano in the Abruzzi. He entered the order of the Franciscans in 1416. He helped to reform his order in conjunction with Bernardino of Siena, and he preached against many heretical orders which had come into existence in Italy, especially the Fraticelli. He was twice made vicar-general. He converted many of the Hussites of Moravia back to the Rom. Church. He had been sent to Moravia as papal legate in 1451. When in Silesia he incited the people to persecute the Jews, and many were burned. He also preached against the Turks after the fall of Constantinople. He took 10,000 Christians to Belgrade in 1456 to help John Hunyadi, and also assisted to release that tin. from the hands of the Turks. He was canonised in 1721.

Capital (and Capitalism). C. may be shortly defined as that part of wealth which is accumulated in order to assist future production. In commerce the term is used to express the stock of the merchant, manufacturer, or trader, used in carrying on his business, in the purchase or manuf. of commodities, and in the payment of wages of labour; in this sense it includes not only money, but also buildings, machinery, and all other material objects which facilitate commercial operations. In a more extended form C. embraces not only the C. of particular individuals, but the entire C. of a country, in which latter sense it may be defined as the products of industry possessed by the community, and still available for use only or for further production. C. may be applied either directly in the employment of labour, or

directly in aid of labour; it may be spent in the food and clothes of labourers, or in tools and other auxiliary machinery, to assist their labour and increase its productiveness. The former is usually termed circulating C. in political economy, and the latter fixed C. While the foregoing may be accurate deductions from current politico-economical theories of C. it is to be observed that C. in social polemics is regarded by some schools of thought as that which is radically opposed to labour. Karl Marx, starting from the position that the economic structure of society, i.e. the method of production and distribution of the products of labour, is the basis upon which everything else rests—the juridical, the religious, the political, the social life of the people—argued that while political economy was right in holding that the consumption of surplus products by productive labour was a feature of accumulation, it was wrong in holding that all surplus value that is changed into C. became such C. as was represented by labour power. With the same critical analysis of prevalent principles of economists, Marx considered that private property, based upon the labour of its owner, had become by the evils of our civilisation replaced by what he termed 'capitalistic' private property, based on the labour of other persons than the owner of the property. Henry George, in *Progress and Poverty*, contended that the wages of labour were paid from the value of that which labour produces, and that therefore labour produced its own remuneration. Opposing theories of political economy assert that the accumulated savings of labour and of accruing profits reserved for development, and generally to extend the means of progress necessary to an advancing community, constitute a collective abstinence on the part of both capitalist and labourer for the ultimate good of all, and that, because the capitalist postpones or denies himself the present enjoyment of a portion of his means of consumption in the expectation of prospective reward, C. is justified in claiming such reward, whether by way of rent or interest or profit. It is further argued that wages are paid not out of labour but out of C. It may be said that the ultimate source of both wages and profits is the value of that which labour and C. combine to create, and that no progress can be made in any sphere of industrial activity without the help of reserve funds, controlled by few or more persons who risk those funds for the sake of progress. From the moment at which a man produces more than he consumes, he is creating C.; and the accumulated surplus of production over the consumption of the whole community is the C. of a country. Those parts of the products of labour which are reserved for the reproduction of other commodities, and those intended solely for use or consumption, have constituted a distinction amongst political economists. Adam Smith classed the one as C. and the other as revenue. Both, however, are generally regarded as forms of C., although it is true

that the accumulation of C. proceeds slowly or rapidly in proportion as one or other of these modes of expenditure is most prevalent. As to the relation of profits to accumulated C., John Stuart Mill laid it down that in proportion as C. increases the rate of profit falls, because the competition of C. with C. is more active than that of labour with labour (*Principles of Political Economy*). It is generally agreed that a high rate of profit is favourable to accumulation; also that rich and populous countries are denied this advantage; that, if they enjoyed it, their C. would continue to increase more rapidly than it does in fact increase; but that, under ordinarily favourable circumstances, the masses of inherited C. and the aggregate savings of vast numbers of capitalists still facilitate accumulation in a greater ratio than the increase of population, which a high state of civilisation has a tendency to check. In ordinary parlance C. and money are synonymous; but it is entirely erroneous to suppose that C. and money can be the same thing. If they were so, it would be untrue to say that C. was one of the requisites of the production of wealth, for money in itself does not assist in the production of wealth. The bank deposits of a country form what is called its 'floating C.' Such deposits may be withdrawn soon or late, or, on the other hand, may continue to accumulate for a long period; but in any case they are actual money values of wages, rents, profits, commodities, and interest, placed temporarily or permanently at the service of the community for social uses in exchange for a rate of interest. Such deposits are not convertible into an equal amount of bullion, much of them being in the form of bills, securities, etc., and a country is deemed richer in proportion as these deposits increase in amount, because such increase favours an extension of resources for employment. It is usual, indeed, to distinguish between the money market and the C. market, though in both markets it is not money but the command of C. which is the purpose of an exchange transaction whether for a long or short term.

History of Capitalism.—It has been rightly observed that the accumulation of wealth is necessary for the creation of a capitalist society, but that such a society is not the result of a simple process of evolution from the mere existence of C. The accumulation of surplus wealth or C. was fostered by means of commercial transactions, more especially when these were carried through on a large scale and involved the use of credit. On the termination of the crusades and the estab. of peace between E. and W. after sev. centuries of intermittent warfare, the E. began to pour her treasures into Europe. From their geographical situation the large cities in Italy were the first to profit from this new commerce, and a capitalist state of society began to show itself in the city states of Italy. This economic stimulus had its repercussions. At convenient points on the trade routes leading from Italy to the N.W. of Europe, fairs

were estab. These existed at first for the exchange of goods—barter pure and simple. But later the use of money became necessary, and from the variety of coins in use a new type of merchant came into being. This was the trader, who carried on the business of money exchange, and the foreign exchange of to-day had its beginnings with him. The *lettre de foire* (fair letter) was the forerunner of our modern bill of exchange. Another development was the system of transferring and cancelling these letters as they fell due at the fairs, which thus came to perform, in addition to their normal functions, the actions of the clearing-houses of to-day. From commercial C. to financial C. was but a short step, and the troubled times of the Middle Ages rendered it necessary for the heads of states often to borrow money. These borrowings enriched all who took part in the money trade—tax-collectors, lenders, bankers, all had their profits, and thus helped in the accumulation of large stocks of C. A development of the fair was seen in the estab. of exchanges, which assumed a growing importance in the sixteenth century. In the fairs the business of buying, selling and settlement could only be carried on intermittently (i.e. when the fairs were held at their different seasons), but the estab. of the exchanges rendered such operations a matter of daily routine. Although the Church had long forbidden the lending of money at interest, govts. were soon forced to recognise the legitimacy of this transaction, being moved by the value and increasing multiplicity of exchange operations. Lending money at interest is one of the props of modern capitalism. The business of fairs and exchanges brought negotiable securities into use, and these contributed to the increase in speculation. As the estab. of trade between the E. and W. after the crusades gave rise to a regeneration of the economic life of Europe, so did the discovery of America give additional impetus to this economic life, and in particular to the larger nations of W. Europe. Maritime and colonial commerce expanded, and Europe was enriched by the receipt of the tropical products of the Far E. and the gold and silver from the mines of the New World. Another development which must be noticed at this time was the estab. of large colonial trading corporations such as the Eng. and Dutch E. India Companies. It appears, therefore, that capitalism, first developed along commercial lines and later along financial lines. The rise of Holland as a great economic power in the seventeenth century was due to her success as a commercial and financial nation. Her maritime trade was considerable, and she conducted a lucrative business in negotiable securities. But by the beginning of the eighteenth century, Holland's rapid expansion had ceased. She was primarily a commercial country, and industrialism had now set in, bringing England and France to the forefront by their ability to export not only natural products, but also the products of their

manufacturers. The rise of England and France marks another stage in capitalism which, in addition to its commercial and financial functions, now began to exert its influence upon manufacturing industry. This at first had been in the hands of small men who had little C. These were gradually ousted by larger merchants who sought to control the rural and domestic industries. They collected the products and found the customers. To them went a larger share of the profits than to the artisan or craftsman, who lost control by degrees. Industrial C. has been extended by the growth of large corporations, which were at first formed to control industries where the initial outlay of C. was very high, but which now control practically every branch of modern manufacturing industry. It may be said that the three forms of C.—commercial, financial, industrial—now operate concurrently. In modern times the influence of C. has made itself felt in practically every field of economic effort. At its commencement the colonial system assisted greatly in the development of C. but this development was in turn responsible for the overthrow of the trade monopolies which had been estab. for the benefit of the mother country. These monopolies came to be regarded as obstacles to the natural expansion of commerce, and the rise of industrial C. may be said to have brought about the fall of the colonial system. To understand the capitalism of to-day one must understand the process of its evolution. Karl Marx studied it in relation to labour, but this does not go far enough. His great achievement lies in the fact that he drew attention to the social effects brought about by the evolution of capitalism. He demonstrated that it had created social classes characterised by economic rather than other distinctions, the effect of which has been to make society much more mobile and less hemmed in by the barriers of former times. Nor is it apparent that class consciousness in the labouring classes, which resulted from economic changes, showed itself as a sudden manifestation. Even at the dawn of the capitalist system social unrest made its appearance. This was particularly noticeable in the Low Countries, where thousands of workmen became dependent upon the merchants engaged in the export trade. Then, as now, commerce had its good and bad times, and it was the workmen who suffered during the bad periods. Rising, often accompanied by bloodshed, were far from infrequent, and, by degrees, the craftsmen took their place in the gov. of the Flemish towns. They seemed to be moved by a guild rather than a class spirit. It is worthy of remark that at the beginning of the Industrial Revolution (i.e.) in England it was the workmen who opposed innovation. They were in reality the conservatives who demanded the maintenance of the old order of things. But in the end the policy of *laissez-faire* as opposed to intervention prevailed, and the new industrialists developed their

manufacturing businesses with little or no interference from the State. There is little doubt that the labouring classes in England suffered during this period of transition. A picture of Europe in the years before the First World War was drawn by J. M. Keynes in his *The Economic Consequences of the Peace*, 1920. He states that 'Europe was so organised socially and economically as to secure the maximum accumulation of C. While there was some continuous improvement in the daily conditions of life of the mass of the pop., society was so framed as to throw a great part of the increased income into the control of the class least likely to consume it. The new rich of the nineteenth century were not brought up to large expenditures, and preferred the power which investment gave them to the pleasures of immediate consumption. In fact it was precisely the inequality of the distribution of wealth which made possible those vast accumulations of fixed wealth and of C. improvements which distinguished that age from all others. Herein lay, in fact, the main justification of the capitalist system. If the rich had spent their new wealth on their own enjoyments, the world would long ago have found such a regime intolerable. But like bees they saved and accumulated, not less to the advantage of the whole community because they themselves held narrower ends in prospect. The immense accumulations of fixed C. which to the great benefit of mankind were built up during the half century before the war could never have come about in a society where wealth was divided equitably. The railways of the world, which that age built as a monument to posterity, were, not less than the Pyramids of Egypt, the work of labour which was not free to consume in immediate enjoyment the full equivalent of its efforts.'

It is perhaps true to say that in recent years, and particularly since the development of class consciousness, the C. system has been more widely, more bitterly criticised than any other human institution. Its detractors point to its blemishes, but rarely indicate the blessings which it has conferred. These are too often taken for granted. The world has yet to await the outcome of the greatest experiment ever undertaken by man in an endeavour to ameliorate the lot of his fellows by the overthrow of the C. system and the imposition of a State Socialism. At present it is impossible to foretell how Russia will finally emerge from this experiment. A striking expression of opinion in defence of C. in relation to unemployment will be found in Adolf Weber's pub. lectures. His opinion is that the credit for Germany's power to absorb large numbers of her unemployed was due not to any political policy, but to the versatility of capitalism. But the Nazi regime disproved his thesis and showed that Ger. labour was for many years regimented, no less than her C. resources, in the one aim of rearmament.

In the closing period of the First World

War and immediately succeeding years there was a prevalent opinion that co-operation must take the place of competition if the horrors of another war were to be avoided. Additional impulse was given to social reform by the spectacle of the many enriched at the expense of the masses. Definite expression was given to this mental attitude in those sections of the Versailles Treaty which deal with the relations of capital and labour, relations which were explicitly recognised as matters of international concern. In its condemnation of the conception of labour as merely 'a commodity or article of commerce,' the treaty made a concession to the humanitarians; and, in the creation of the International Labour Conference, it provided the machinery for giving practical expression to changed views. Prior to the treaty, the Brit. Labour party, in Jan. 1918, had in its 'reconstruction' programme, expressed the belief that the 'individualist system of capitalist production had received a death-blow, and that with it must go the political system and ideas in which it naturally found expression.' It is more than doubtful whether many of those in the party to-day would endorse these somewhat emotional opinions. Ger. scholars, like Sombart and Schmalenbach, have also advanced theories which ignore the falsification of Marxian theory in its fundamental positions. Nowhere in the present state of society is there any sign of evolution on the lines of Marxian prophecy, which, broadly stated, is that the smaller capitalist would be engulfed by the few largest and that this process of centralising the means of production must at length reach the point of incompatibility with the capitalist system, and capitalist private property becomes thereby 'socialised' and at the disposal of the previously expropriated working class. Only in Russia has a serious attempt been made to exploit this conception of society. If the Marxian theory of concentration has now been very generally abandoned, it is because theoretical investigation has invalidated every step in its hypothetical development. Facts continue to multiply the evidence in favour of the capitalist system: contrary to Marx, the system does not involve economic crises; nor depress the condition of the working class; nor does it, through the introduction of ever-improving technical machinery, reduce the chances of employment—all of which consequences are repeatedly asserted in Marxian theories and by the followers of Marx. But if theoretical investigation has refuted Marxism, the communistic experiment in Soviet Russia has supplied the most powerful arguments to those writers who defend the capitalist system. Russia, hit by the First World War far less than most of the other belligerents, has only very slowly shown a power of recuperation in any way comparable to the rest of Europe, in spite of her unlimited potentialities. So impracticable did Lenin find his anti-capitalist organisation, that he had perforce to introduce his 'new eco-

nomic policy,' which allowed a restricted degree of free exchange in the capitalistic sense. Lenin's attempt to save the situation by the introduction of free price fixing for marketed products was foredoomed, for the reason that it could have been effective only in regard to capital. It had no relation to a system which, temporarily at all events, abandoned private property in capital. There came to be a private money market in Russia on a limited scale, and, as may be supposed from Russia's difficulty in obtaining credit from other nations, this market showed phenomenal private discount rates. A significant development of C. after the First World War was the growth of cartels (*q.v.*). It has been argued that the formation of cartels is the necessary consequence of ruinous competition, and that one important factor in this competition as it affects cartels is the growth of fixed costs, i.e. the costs which form a permanent part of every concern irrespective of demand. The relationship of fixed and liquid capital is of great importance in the process of trustification, but so long as there is no external authority to regulate competition the cartel has to assume responsibility for fixing prices. There is, thus, no essential connection between fixed prices and the formation of the cartel, and a defence of cartels is that they are organisations which convert ill-judged and ruinous into regulated competition and, in the light of their tendency to increase in number, are a strong affirmation of the competitive and, therefore, capitalistic system. See H. Withers, *The Case for Capitalism*, 1920; Sir E. J. Henn, *Confessions of a Capitalist*, 1925; H. Sée, *Modern Capitalism* (trans. by H. R. Vanderblue and G. F. Doriot), 1928; A. Weber, *In Defence of Capitalism*, 1929 (trans. by H. F. Stenning, 1930); J. M. Keynes, *The General Theory of Employment, Interest, and Money*, 1936; R. G. Hawtrey, *Capital and Labour*, 1937; and M. Dobb, *Political Economy and Capitalism*, 1937, *Studies in the Development of Capitalism*, 1946, and *Soviet Economic Development since 1917*, 1948.

Capital, in architecture, see COLUMN.
Capital, of a company, see under COMPANY AND COMPANY LAW.

Capital Account, see under BOOK-KEEPING.

Capital (Lat. *capitalis*, pertaining to the head) in typography, larger and differently formed letter placed at the head of a paragraph, at the beginning of lines of poetry, of sentences, of proper names, etc., to help the eye and so facilitate reading. The anct. never used Cs. (*majuscula*) and small letters (*minuscula*) concurrently; either all Cs. were used or all small letters. At the old MSS. are in Cs. alone up to the seventh century. After this time Cs. began to be used only at the beginning of books and chapters; they were often elaborately illuminated and decorated: 'We writeth capital letters with red colour . . .' Trevisa's explanatory notes in Higden's *Polychronicon* i. 129. These illuminated Cs. were very much bigger than the small letters, and not, as in ordinary

typography, about twice the size. There were two chief types of Cs.—the square and the rustic; the latter were characterised by curves and by finer strokes. Cs. are in general use at the present day in nearly all languages, and their use is chiefly to help the reader. In the Ger. language every substantive has an initial capital; in Eng. Cs. were formerly used much more freely than they are now. Adjectives derived from proper nouns, as *English*, *French*, etc., have initial Cs. in Eng. though not in Fr. or Ger.; so also have all nouns and pronouns referring to God. The pronoun I is always written with a capital; the Latins did



THE CAPITAL 'I' AT THE OPENING OF COVERDALE'S EDITION OF THE BIBLE

not think it necessary to write in this way an *i* standing alone: the Lat. verb *ire*, to go, had in the imperative *i*, and so it was written.

Capital Levy. After the First World War the national debt of the United Kingdom, which had stood at £650,000,000 at the beginning of hostilities, was more than ten times as great in 1920, when it reached the unprecedented total of £7,830,000,000. The question arose as to how this debt was to be paid. The facile and illusory idea that the losers of the war should pay all its costs was not treated seriously by any economist or statesman of repute. The debt had therefore to be paid in the main by the Brit. people, and the question resolved itself into the query, How and by whom? It was suggested that this might be done by means of a levy upon capital. The first recorded demand for a C. L. was made by a private member in the House of Commons in Nov. 1914. It was put forward in the early days of the war as a 'business proposition,' i.e. as an alternative to a high income tax. But as the war continued so-called ethical factors came into the problem. Firstly, it was said that as

'life' was being conscripted, 'wealth' should be conscripted too; secondly, despite the heavy income, super-, and excess-profits taxes, enormous fortunes were being made by some, while others were being impoverished. The suggestion of a C. L. at first found some supporters in each political party, and among the Conservatives Mr. Bonar Law was said to have had some sympathy with the idea. It remained a definite part of the Labour party's programme until 1927. The basis of assessment was to be individual and not corporate. Companies, co-operative societies, and the like would not be liable, though the shareholders would if their incomes exceeded a certain figure. It was proposed that those whose total net wealth exceeded £5000 should become liable to the operation of the levy. This was the same figure as that proposed by the Board of Inland Revenue in 1919 in its scheme for the taxation of war fortunes. This minimum would have exempted small property owners and those then exempt from income tax, and have brought within the scope of the measure between 300,000 and 400,000 persons. An illustration of the scale of levy proposed in that scheme was that a man worth £6000 would pay £50, or 1.2 per cent of his total fortune; one worth £10,000 would pay £550, or 5.5 per cent; one worth £100,000, would pay £32,800, or 32.8 per cent; and a millionaire would pay £502,800, or 50.3 per cent of his fortune. The Colwyn Committee on Taxation and the National Debt, appointed by the Labour Administration, in 1924, in its report of 1926, rejected the scheme, and even the minority report of that committee was favourable only to the levy 'provided it were generally approved.' Among other European countries, during the period between the two world wars, Czechoslovakia attempted to launch a C. L., but was not very successful, for the payment of it by instalments practically reduced it to a heavy income tax. Switzerland, in a referendum, rejected a C. L. In Oct. 1937, the It. Gov. imposed a C. L. of 10 per cent on limited and joint stock companies, and a year later the levy was extended to cover private firms earning an income over 10,000,000 lire. A similar experiment was made in Hungary in March 1938, when a large-scale defence plan was announced as being financed by a C. L. on incomes of over 50,000 pengoes (£2000 approx.).

Capital Punishment, punishment by death for crime in conformity with the sentence of a properly constituted tribunal, civil or military. Whatever may have been its origin, whether in feelings of revenge, regularised by the *lex talionis* (the law of 'an eye for an eye and a tooth for a tooth'), or in theories of retribution or deterrence, C. P. is a term opposed to all irregular modes of punishment such as the Amer. 'lynch law,' or any modern survival of 'blood-avengers.' C. P. is so named from the Lat. *caput*, because hanging or decapitation was the most usual mode of C. P. In Rom. law, however, the term included any of the

various forms of *capitis deminutio*, or loss of status, i.e. deprivation of liberty, citizenship, or family rights, as a consequence of certain acts. In more primitive societies, when civil tribunals were far from being of certain authority or possessed of adequate machinery for enforcing their decrees, the punishment of murderers or other homicides was, as in the case of most other kinds of criminals, a matter for self-redress. A modern survival of this is to be found in the Corsican vendetta. Subsequently, in England during Saxon times, man-slaying became the subject of compounding by the payment of what was known as wergild, or blood-money, the amount of which varied with the degree of importance in the social scale of the murdered person.

History of Capital Punishment.—In pre-Norman times there were various forms of C. P., including hanging, decapitation, burning, and hurling from rocks, after the manner of the Rom. custom of throwing malefactors from the classic Tarpeian Rock. After the Conquest, mutilation seems to have been substituted, and this is the punishment mentioned in the assizes of Clarendon and Northampton (*temp.* Henry II.). The law was variable for some time after that but gradually crystallised into such a condition that C. P. became the common punishment for a great number of crimes, comprising treason and all felonies except larceny and mayhem (wounding). This state of things continued down to 1826, at which time there were nominally no fewer than 200 crimes punishable by death. The law and practice were, however, somewhat divergent, and as Bentham points out in his *Theory of Legislation*, both juries and judges resorted to all manner of subterfuges to evade the literal harshness of the law. The strict letter of the common law was also subject to the mitigating influence of the curious privilege of benefit of clergy (*q.v.*). Benefit of clergy exempted clergymen in certain cases from criminal punishment by secular judges. Afterwards the privilege became extended to all, whether cleric or lay, who could read or stumble through the 'neck-verse.' Benefit of clergy was never permitted in cases of high treason or in offences not capital. At the present day in England the only capital offences are treason, murder, piracy with violence, and the crime of setting fire to His Majesty's vessels of war, arsenals, military or naval stores, and ships in the port of London. The sentence of C. P. may also be passed by courts martial in various cases of mutiny, desertion, or sleeping on sentry duty. There had been no execution for treason for a century or more until the case of Roger Casement (*q.v.*). All the old barbarous features of punishment for treason, comprising the drawing of the traitor's body to the place of execution on a hurdle, disembowelling, and quartering the body, have disappeared long ago.

Many countries in the Old and New World still retain the death penalty for treason and murder, and, in some cases,

for other crimes. The general trend of public opinion has not on the whole been averse from the death penalty as a fit sentence for murder at least. In England an attempt half a century ago to abolish it in the case of setting fire to arsenals and ships was defeated. The ferocity of our own law up to 1826 apart from the fact that the letter of the law was frequently ignored, was such as to occasion an outburst of indignation in the writings of Goldsmith and Bentham. In conformity with his general theory of punishments and rewards, that the evil of punishment must not exceed the advantage to the offender of the offence, and that punishment should be exactly and mathematically proportioned to the offence, Bentham would have abolished the death penalty in most cases, retaining it only for treason and murder. Bentham does not appear to have condemned publicity in executions, but rather favoured the idea of the *auto-da-fé*, provided only it were an act of justice, carried out with every solemnity of preparation and ceremony, and not regarded as an act of faith. Bentham was greatly influenced by the writings of Beccaria, and in one passage says that 'the more attention one gives to the penalty of death, the more will he be inclined to adopt the opinion of Beccaria—that it ought to be disused.' In an eloquent passage he conceives that 'the prodigal fury' involved in C. P. reveals an imbecility of soul which sees in the destruction of the convict the most convenient way of securing that he shall no longer be an object of concern to society; and he concludes his words on C. P. by denying the validity of the deterrent theory on the ground that most criminals fear death less than want, and humiliation. Beccaria, in his *Treatise on Crimes and Punishments*, first pub. in 1764, argues against the capital sentence being carried out in any case, denying the right of man so to punish, and maintaining that it is a less efficacious mode of deterring others than the continued example of a living culprit condemned by labouring as a slave to repair the injury done to society. Beccaria's work had the merit of attracting greater attention to the subject of crime and punishment; yet it contains many principles of doubtful value and some deductions that are not sound. Romilly's criticism that Beccaria's admission of the right of human tribunals to inflict certain more severe and effectual punishments than death involves an admission of the right to inflict the less severe penalty of death is almost fatal. The question of C. P. in the United Kingdom was considered by a royal commission, which submitted its report in 1866. The commissioners recommended, *inter alia*, the restriction of C. P. to high treason and murder; changes in the law as to child murder by women; the abolition of public executions, and the institution of varying degrees (as in America) in the legal notion of murder. Only the recommendation as to public executions has been adopted since 1866.

although women are never in practice sentenced to any but the lightest penalties—indeed, are often acquitted—for the destruction of illegitimate children. Since the First World War legislation has been passed in the United Kingdom enabling a judge to avoid a capital sentence on a woman in an infanticide case. Moreover, on Nov. 16, 1938 a resolution was passed by members of Parliament, 114 being in favour, and 89 against, recommending that the death penalty should be abolished for a five-year experimental period. The gov. did not, however, introduce the necessary legislation.

The report of the select committee of the House of Commons on C. P., issued in Dec. 1930, recommended the abolition of the death penalty for an experimental period of five years in cases of trial by civil courts in time of peace and that the substituted penalty should be that which is now attached to reprieved murderers. This report is hardly representative of national opinion, for it was not unanimous, and the six Conservative members of the committee withdrew from the proceedings altogether, through entire disagreement with the draft report of the chairman.

In the proceedings in the Commons on the Criminal Justice Bill in 1948 some 200 members supported an amendment to suspend the death penalty for five years, but the House of Lords struck out the amendment. The gov. then proposed their own amendment to establish two degrees of the offence of murder and to suspend the operation of the death penalty upon murderers found guilty only in the second degree. To constitute murder in the first degree there must be, first, 'express malice or an intention at least to maim and an act which might reasonably be expected to endanger life; and, secondly, the crime must fall into one of a number of categories: murders by poisoning, murders incidental to certain grave crimes, such as rape or robbery; murders of policemen and others in resisting arrest; murders of prison officers by prisoners; and second murders. The period of suspension of C. P. for murder in the second degree remains five years. The murderers relegated to the less heinous class will be predominantly those who under the existing law would be recommended for reprieve. The new clause will not affect the home secretary's power to recommend clemency for murderers sentenced to death. In a White Paper on C. P. presented to Parliament in May 1948 by the home secretary (Cmd. 7419) it is stated that between Jan. 1, 1920, and March 31, 1948, of 267 persons convicted of murder in Great Britain and whose death sentences were commuted to penal servitude for life, 209 were released after detention of five years and over, and 58 after less than five years. The latter category included those who committed murder from merciful motives, survivors of suicide pacts, and those concerned in cases where exceptional circumstances reduced the moral guilt.

Countries in which and Crimes for which Capital Punishment is inflicted.—In Great Britain there are four capital crimes: high treason, wilful murder, piracy with violence, and setting fire to arsenals, dockyards, etc. Broadly, the codes of most of the Brit. dominions and European countries where C. P. still obtains prescribe the penalty for treason and for murder 'with aggravating circumstances.' In New South Wales, the following crimes are also punishable with death: rape, carnal knowledge of a girl under ten years of age, attempt to murder (in various specified ways), and setting fire to a dwelling-house with the knowledge that some person is within. In Victoria, robbery with violence and burglary with wounding are added to the Brit. list. In Canada, under the Criminal Code of 1906, only treason, murder, piracy with violence, and rape are capital crimes, but in 1924 the practice of hanging women was reintroduced after an intermission of a quarter of a century. In Newfoundland, W. Australia, and S. Australia the law is much the same as that of Great Britain; while in the Union of S. Africa, rape is added. In Australia, Queensland abolished the death penalty and New Zealand abolished it in 1941 after remitting all death sentences from 1936 onwards. In India, under the Penal Code of 1860, the list of capital crimes includes waging war, abetting mutiny, murder, attempt to murder by a life-convict, causing the execution of an innocent person by giving false evidence, and dacoity with murder. In Germany under the Republican and Nazi regimes, C. P. was inflicted for murder, criminal uses of explosives, and conspiracy against the lives of the members of the gov. In normal times, death was the sole penalty in Japan for injury or attempted injury to the person of the emperor; causing a foreign country to make war on the empire; and surrendering a fortification, troops, etc. In France extenuating circumstances enable the court to impose a sentence of imprisonment for life instead of the death penalty, and the President of the Republic may also substitute life imprisonment. *Lèse-majesté*, high treason, and premeditated murder are punishable in Hungary by death, but the first-named would seem to be anachronistic since the estab. of a republic; and in Yugoslavia murder is a capital crime, but except when an attempt was made on the life of the sovereign, the penalty was not inflicted for political crimes. C. P. also prevails in Spain and Turkey. A woman was hanged in Hungary for murder in 1931, the last previous execution of a woman in that country being in 1921. In the U.S.A. the position is as follows: Treason against the Federal State is punishable with death, or imprisonment, or a fine; murder in the first degree (equivalent to premeditated) is punishable under the Federal statutes, with death by hanging, but in various states is also punishable with death by electrocution, or lethal gas, or with life imprisonment. C. P. without possibility

of alternative exists in only five states: Connecticut, Massachusetts, New Mexico, N. Carolina, and Vermont. In the Federal courts rape is also punishable with death by hanging; but in some of the states imprisonment is an alternative punishment. Arson, though also a capital offence under the Federal laws, is punishable with death in Delaware, Alabama, Illinois, N. and S. Carolina, and Virginia, or with life imprisonment in a number of other states. Kansas and S. Dakota have both reverted to the use of the death penalty.

Countries where Capital Punishment has been abolished.—C. P. was abolished in Argentina by the Penal Code of 1922. In Brazil, it was abolished in 1891, when penal servitude for thirty years was substituted; though it may still be inflicted under the Constitution for certain crimes committed when the country is at war. Other S. and Central Amer. countries in which imprisonment for varying terms has been substituted for the death penalty are Columbia, Costa Rica, Dominican Republic, Ecuador, Honduras, Panama, Peru, Uruguay, Venezuela, and in a number of the states of Mexico. In the Netherlands it was abolished in 1870, but it had been discontinued in practice long before the statute of that year; imprisonment for life, which generally means for twenty years, is substituted, and solitary confinement is inflicted for the earlier portion of the term. In Italy after C. P. was abolished in 1889, imprisonment for life was the punishment for murder with premeditation, parricide, etc.; but under the Fascist regime C. P. was reinstated. The new It. constitution provides for the abolition of the death penalty. In Norway, C. P., though still prescribed for certain cases of crimes committed when the country is in a state of war, was abolished by the Criminal Code of 1905. Portugal abolished the death penalty in 1867; Sweden by a law of June 1921, when penal servitude was substituted; (in Sweden during the years 1932-47 twenty prisoners convicted of murder were released after periods of detention averaging fourteen years); and Switzerland by the Federal constitution of 1874, though in 1879 an amending Act gave the cantons liberty of action in the matter since when ten have reintroduced the penalty. In 1942 the death penalty was abolished for the whole of Switzerland, and life imprisonment is laid down for murder. In Belgium, Denmark, and Finland C. P. exists in theory, but is not actually carried out. No one has been executed in Belgium since 1886, persons under sentence of death being invariably reprieved and sentenced to life imprisonment; in Denmark no execution has taken place for the past forty-six years, though in theory it may be inflicted for high treason and murder; while in Finland no execution had taken place for almost a hundred years prior to 1918, in which year many death sentences were carried out under martial law during the insurrection of the Finnish Communists. The new code for Czecho-

slovakia, replacing the Austrian and Hungarian laws for the constituent countries, made no provision for C. P. In 1947 Russia declared that the death penalty would no longer be used and that 25 years' imprisonment would be the alternative. In the U.S.A. C. P. has been abolished in Maine, Michigan, Minnesota, N. Dakota, Rhode Is. (since 1852), and Wisconsin (since 1853). In Iowa it was abolished in 1873 and reinstated, and in Maine it was abolished, reinstated, and again abolished. It was also abolished in Washington, but a special verdict imposing the death penalty may be given by the jury.

See J. F. Stephen, *History of the Criminal Law of England*, 1883; Russell, *On Crimes*; F. Pollock and F. W. Maitland, *History of English Law*, 1895; E. Bowen-Rowlands, *The Judgment of Death*, 1924; E. R. Calvert, *Capital Punishment in the Twentieth Century*, 1927; and the Report of the Select Committee of 1929.

Capitanata, unct. prov. of the kingdom of Naples, Italy, now called Foggia (*q.v.*). It was bounded on the N.E. by the Adriatic, on the N.W. by the dist. of Samnio, on the S.W. by Principato Ultra, and on the S.E. by Basilicata. It is an agric. dist. Lemons, oranges, capers, oil, terebinth gum, cheese, cattle, and ponies are exported.

Capitation Tax, see POLL-TAX.

Capito, Gaius Ateius, Rom. jurist of the time of Augustus. He became consul suffectus in A.D. 5, and curator aquarum publicarum in 13, and *d.* in 22. He studied law under Offilius, and was a rival of Labco. C. founded the Sabinian school of lawyers in opposition to the Proculian school of Labco. Only fragments of his works remain.

Capitol, **Capitolium**, or **Mons Capitolinus**, name given to the temple of Jupiter Capitolinus and the other buildings, such as the citadel and the Tabularium, built by Quintus Lutatius Catulus in 78 B.C., in which the public archives were kept, which stood on the Capitoline Hill (Lat. *mons capitolinus*) in auct. Rome. The temple was founded by Tarquinius Priscus about 600 B.C., and dedicated in 507 B.C. It was injured by fire during the civil wars of Sulla's time in 83 B.C., rebuilt, but destroyed again by fire in A.D. 69 and A.D. 80. It was again restored by Domitian. It formed the central point of the religious life of Rome, containing as it did the Sibylline books. To it generals went to make thank-offerings to the gods for triumphant campaigns, and consuls to record their vows, while the senate often met on the hill. The temple was surrounded by minor buildings, and by an esplanade on which were statues of gods and heroes. The steepness of the hill rendered it an admirable natural fortress. Near the temple was the Tarpeian rock from which traitors were thrown. On the N.E. peak—the Arx—stood the temple of Juno Moneta. In the Middle Ages all the buildings had fallen into ruins, and in 1534 Michelangelo was commissioned by Pope Paul III. to draw up plans for new buildings on the site.

The C. now consists of a square, containing a statue of the Emperor Marcus Aurelius, the Campidoglio, built by Michelangelo, but only an inferior example of his work, the Senatorial Palace (1579), the Capitoline Museum (1644), and the church of S. Maria in Ara Coeli. More than twenty imperial provincial cities built their Cs. on the model of that at Rome, the oldest being at Capua, and the most modern that at Washington. The C. of Toulouse still exists, and there are ruins at Brescia and Pompeii.

Capitularium (Capitularies) (Lat. *capitulum*, chapter, from *caput*, head), name applied to the constitution or laws promulgated by the Frankish kings. These laws were classed under different chapters, called capitularies. The first collection of these was pub. by Ansegisus, abbot of St. Wandrille in Fontenelle, in the reign of Louis the Pious. The best modern ed. is that of Boretius, *Monumenta Germaniae historica*, etc., Legum sectio II., vols. I. and II., 1883-97.

Capitulation, in time of war, an agreement for the surrender to a hostile armed force of a fortress, tn., piece of ter., or body of troops naval or military, with the detailed conditions under which the surrender is to be made. The term used to be restricted rather to the surrender of a beleaguered garrison. The agreement by which an army or a large div. of troops surrendered to a superior force or engaged to evacuate the ter. which it occupied when its strength and condition were yet such as to make itself respected by the enemy, constituted a set of circumstances known as a convention. Such was the convention of Cintra, made at Lisbon, between Gen. Dalrymple and the Fr. general, on the departure of the Fr. army from Portugal in 1808. When the provisions and ammunition of a garrison or force are nearly expended, and no chance remains of the siege being raised or the force succoured, the governor of the besieged town, or commander of the defeated force, is justified in entering into an agreement with the enemy respecting the terms on which he consents to surrender; and by the rules of war he is entitled to obtain an honourable C. It is to be observed, however, that if he should postpone surrender proposals till his provisions are entirely exhausted, the enemy may refuse to grant terms, and he can then only surrender at discretion. The conditions of C. vary greatly, and are necessarily determined by the circumstances of the case and the degree of generosity or patience of the victors. From the nature of the circumstances of most Cs., no previous instructions are or can be required from the capitulating party's gov. before the final determination of the conditions of C. The conditions generally include the surrender of the arms and military stores of the garrison or other capitulating body to the victors; the officers and troops retain only their private property, but are, or were, allowed to march out of the fortress or tn., or to their place of destination, with the honours of war, that is, with

drums beating and colours flying. Other very usual conditions are, or were, freedom of religion and security of private property. It must be admitted, however, that the rules of warfare on which an ordered C. depends do not always find a place in modern warfare as exemplified in the Second World War. Where a C. is made by an officer who is not invested with the proper authority, or who has exceeded the limits of his authority, the C. is called a sponson. Article 35 of The Hague Convention of 1899 requires a sponson to be confirmed by the express or implied ratification of the state or commander-in-chief on the side of the officer accepting the surrender, coupled with the consent of the other side to accept the ratification, in order to be binding. It is an implied term in the C. of a place that the capitulating force shall not destroy its fortifications, stores, or ammunition after the agreement has been concluded. *Authorities:* T. E. Holland, *The Laws of War on Land*, 1908; W. E. Hall, *Treatise of International Law* (ed. Higgins), 1924; W. Wheaton, *Elements of International Law* (ed. Wilson), 1936.

Capitulations denote the arrangements and confirmatory treaty by which foreigners are granted immunity from the civil or criminal jurisdiction of the state making such C. Such arrangements and treaties necessarily constitute a derogation from the inherent sovereign rights of an independent state, and are only resorted to as against states which can hardly be said to be sufficiently advanced in their civilisation to observe the general rules of international law. An instance of such C. is furnished by the arrangements made at various times since 1535 between the various powers and the former Turkish Porte. Even before the First World War, signs were not wanting that the era of C. was ending. Certain countries, such as Morocco and Tripolitania, had passed under the control and jurisdiction of great powers like France and Italy, whose laws were deemed adequate to the needs of all European nationals. Then other countries, of which Japan is an outstanding example, reached the full status of a great power, which would allow no derogation of their sovereignty. The First World War intensified national feeling, and few nations to-day would, without strong protest, grant capitulatory rights to foreigners. In large part, too, the willingness of a nation of 'backward people' to grant capitulatory privileges depended on the prestige attaching to a united Europe. When this unity was shattered by the First World War the 'backward' countries were encouraged to resist these encroachments on their sovereignty. Also the series of peace treaties at the end of the war deprived the nationals of the Central Powers of these rights, and the Soviet Union in some cases voluntarily abandoned these privileges. The present position is that some European nations have these rights and some have not. By the treaty of Lausanne, 1923, Great Britain gave up her C. in Turkey, and she

abandoned them in Albania in 1928. C. in some form or other for certain European powers continued, however, to exist in China, Egypt, Morocco, and Iran until the Montreux Convention of 1937. By the terms of this convention, which came into effect the following year, C. were abolished, and the former consular courts were replaced in the countries concerned by mixed tribunals set up for a period of transition of not more than twelve years.

Capitulum (Lat. dimin. of *caput*, head), botanical name for a particular form of racemose inflorescence in which the main axis is short and usually disk-shaped, and is covered with sessile flowers. It is typical of the Compositæ, e.g. the daisy and dandelion. This C., or head, is vulgarly confused with a single flower.

Capiz, prov. and city in the is. of Panay, belonging to the Philippines. The city is situated on the N. coast, on a riv. large enough for small steam craft. The climate, though hot, is considered healthy. Sugar and rice are cultivated, and to a lesser extent tobacco, cacao, and Indian corn. The manu. of alcohol, from the fermented juice of the nipa-palm, is extensively carried on, and also cotton and hemp weaving. The fisheries are important. Pop. of city 16,000; of prov. 293,000.

Cap Martin, pine-covered promontory which forms the W. extremity of Mentone, in the dept. of Alpes-Maritimes, France. The prin. feature is the huge hotel which is situated on the cape.

Capnomor, colourless volatile oil found in wood tar from which, with other products, it was first extracted by Reichenbach. It smells something like ginger, and burns with a sooty flame.

Capodistria, tn. of Istria, within the ter. of Trieste. It is a seaport tn. about 9 m. from Trieste, and is situated on an is. in the gulf of Trieste, the is. being connected with the mainland by means of a bridge. Its chief products are oil and wine. It also trades in salt, and its fisheries are of considerable importance. Pop. 13,000.

Caporetto, Battle of, battle of the First World War, which took place on the It. front from Oct. 24 to Nov. 18, 1917, resulting in a defeat of the It. armies. The battle, which was fought over a great area from the Carnic Alps to near Venice, was so named from the fact that the defeat began with the loss of C., a key position, on the Isonzo R., near Monte Nero, a loss occasioned by treachery as well as by military pressure, and so serious that it exposed first one and then another It. army to the risk of being outflanked and enveloped. In Oct. 1917 the main It. armies were still struggling with the Austrians in the broken country along the Isonzo. One It. army was on the Carso plateau fighting for the road to Trieste, another, based on Cividale and Gorizia, was attacking further N., and a third, still further N. on the Upper Isonzo, E. of C., on the Bainsizza plateau. It was then that Ludendorff (q.v.) planned a combined Ger. and Austrian offensive,

with the assistance of large forces of guns and men released from the E. front by reason of the Russian revolution. Ludendorff's strategy was to strike at the less tried It. troops on the Upper Isonzo so as to cut the communications of the It. armies both there and on the Carso and then to outflank them, so as to bring about a major disaster to the entire It. military machine and, by wiping out the It. front as an effective theatre of allied resistance, pave the way for a final offensive on the Fr. and Flemish front. On Oct. 24, Austro-Ger. artillery bombarded the Tolmino positions, outranging the It. guns. The Ger. troops then broke through and crossed the riv., whereupon two It. corps surrendered, thereby exposing C. and rendering It. forces southward liable to be outflanked. The It. retreat from the Bainsizza and Carso plateaux became almost a rout, and by Oct. 28 the Austro-Ger. forces had captured over 50,000 men and 500 guns. Then Cividale and Gorizia fell, and shortly afterwards Udine, the It. H.Q., and the Austro-Ger. armies were strongly entrenched in It. ter. on the Tagliamento R., the number of prisoners rising to nearly 200,000 and the guns captured to 1500. This resulted in the main It. armies withdrawing from the Isonzo and those defending the frontier through the Carnic Alps being driven from the mt. passes into a retreat by the valleys leading to the Piave and Tagliamento Rs. The retreat continued for days during Nov. The Austro-Ger. armies crossed the Tagliamento at various points, and, when Livinza was abandoned by the Its, they became masters of the line of the Piave (Nov. 18). This ended the battle, for Gen. Cadorna (q.v.) was superseded by Gen. Diaz, and strong forces of Fr. and Brit. guns and infantry arrived to strengthen the It. defence; while any further advance by the opposed forces, during the reorganisation of the allied resistance, was prevented by the flooding of country between the Piave mouth and Venice, thereby averting the threat to that city. C. is in Yugoslavia. See R. Cadorna, *La Guerra alla Fronte Italiana*, 1921.

Cappadocia, dist. in Asia Minor differing very much as regards its boundaries at different times during its hist. It was originally a prov. under Persian rule, and included all the N.E. portion of Asia Minor, bounded on the W. by the R. Halys and on the S. by the Taurus. Later on, while still under the rule of Persia, it was divided into two parts or satrapies, the N. one being called C. ad Pontum, afterwards shortened to Pontus—also called C. Minor—and the S. part C. (C. Major). In A.D. 17 C. became a Rom. prov. under Tiberius, and after this time the dists. of Melitene and Catalonia were added to it. Its two chief riva. were the Halys and Melas.

Capparidaceæ, dicotyledonous order of herbs or shrubs found in the tropics and warmer countries. The flowers are hermaphrodite, isobilateral, usually growing in racemes; the sepals are in two whorls of two the petals are cruciform and four

in number, the stamens are either four or more, the carpels are usually two in number, superior, syncarpous, and are borne on a gynophore. The fruit is a silique or a berry. The order resembles the Crucifere in many respects, but few species are economically useful. The flower-buds of *Capparis spinosa*, which grows in S. Europe, are marketed under the name of capers.

Cappel, vil. of Switzerland, in the canton of Z. rich, 4½ m. N. of Zug, and 10 m. S.S.W. of Z. rich. It was here that the reformer Zwingli met with his death in the conflict of 1531, and a monument was erected to his memory in 1838. There is an old Cistercian convent of 1185.

Cappelletti, see CAPULETS AND MON-TAGUES.

Capponi, Gino, Marchese (1792-1876). It, historian and statesman, member of an illustrious Florentine family. He went to Vienna in exile with Ferdinand III., grand duke of Tuscany, but returned to Florence when the duke was reinstated. He devoted himself to travel in foreign countries and to study. Eng. institutions impressed him, and on his return to Italy he strove to improve the condition of the It. people. On the unification of Italy he became senator and president of the Historical Commission for Tuscany, Umbria, and the Marches. His prim. work is *Storia della Repubblica di Firenze*. He founded the *Antologia* on the lines of *Edinburgh Review*.

Capra, genus of Bovidae, including goats and ibex, distinguished by having both sexes with flattened horns and the males with a beard and a strong odour. The species inhabit the mts. of Europe and Asia. *C. ibex* is the Swiss steinhok, *C. pyrenaica* the Sp. ibex, and *C. agagrus* the wild goat of Persia. The last species produces 'bezoar stone' in its stomach.

Capraria, see CABREIRA.

Caprera, is. of Italy, situated to the N.E. of Sardinia, from which it is divided by a strait. It is 6 m. long, 2 m. wide, and about 6700 ac. in area. There are pasture lands and cornfields. Garibaldi had a residence here. Pop. 500.

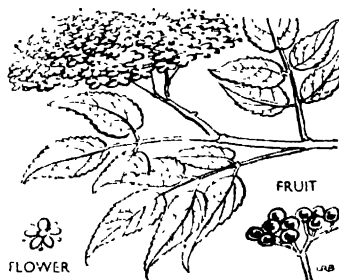
Capri, is. at the extreme S. of the bay of Naples opposite Cape Campanella, about 9 m. in circumference. It is composed almost entirely of calcareous rocks, and the scenery is beautiful. Solaro commanding an extensive view, is the highest point in the is. C., the cap., is situated on one of the accessible spots on the is., and possesses a cathedral. The other tn. in the is., Anacapri, is reached by a narrow road cut in the rocks. N. of this tn. is the 'blue grotto,' for which the is. is famous. It is a cavern entered from the sea, and obtains its name from the reflections of blue seen everywhere. The Rom. Emperor Augustus resided in C., and his palaces were afterwards enlarged by Tiberius. The remains of the Villa Jovis, one of the largest built by him, are still in existence. It is said that Tiberius lived a life of crime and debauchery here, and that from a high rock on which one of his palaces was built he used to hurl people into the sea. The

chief products of the is. are wine, oil, oranges, and figs. Pop. 7500. During the Second World War the Gers. in their occupation of Italy left the is. in the hands of an It. garrison, with whose co-operation C. fell to the Allies on Sept. 18, 1943.

Capric Acid, or **Decolic Acid** ($C_{10}H_{20}O_4$), is found, together with caprylic and caproic acids, in butter, and also in coco-nut and fusel oils. It forms slender needle-like crystals, and has a faint odour somewhat like goatskin.

Capriccio, in music, a name which has been given at different times to different kinds of musical compositions. Thus it has been applied to a composition written not strictly according to rules of form and figure; to a piece composed on original subjects; to a brilliant transcription of one or more subjects by other composers. In the seventeenth-century it was applied to a kind of free fugue for keyboard. Those of the last century were studies with one figure predominating. Sev. examples of Mendelssohn Cs. differ only slightly from regular sonata or rondo forms. A C. is generally in quick tempo; but there is no essential quality except the general one denoted by the name (Scholes). Often the term 'fantasia' could be substituted. As a performing instruction, *a capriccio* means according to the 'caprice' of the performer.

Capricorn, Tropic of, S. of the two tropics, or one of the two parallels of terrestrial lat. corresponding to the celestial tropics. See TROPICS.



CAPRIFOLIACEÆ: LILDER

Capricornus (the Goat), S. constellation which forms the tenth sign of the zodiac, usually represented by a sign consisting of the forepart of a goat and the hinder part of a fish. It marks the winter solstice and was regarded by the ancients as a precursor of good fortune. It contains no large stars, the most important being only of the third magnitude.

Caprification, anct. custom still practised in the Levant for the maturation of figs. It consists in planting wild fig-trees among trees bearing edible figs, grafting them on the cultivated plants or merely hanging the branches upon them. The *Caprificus*, goat, or wild fig, bears male

flowers, and the cultivated fig chiefly female, so that by introducing the former to the latter pollination may be effected by means of wasps and parasitic insects.

Caprifoliaceæ, monocotyledonous family of trees and shrubs, found in temperate countries. The flowers are hermaphrodite, actinomorphic, or zygomorphic, usually pentamerous, have epipetalous stamens, an inferior gynoecium consisting of two to five inferior syncarpous carpels with numerous ovules; the fruit is a berry, drupe, or capsule. The leaves are opposite and usually exstipulate. Many species are found in Britain, e.g. *Sambucus nigra*, the elder; *Viburnum Opulus*, the guelder-rose; *Lonicera Periclymenum*, the honeysuckle; and *Synphoricarpos racemosus*, the snowberry. *Diervilla* (*Weigelia*) is an ornamental shrub, often cultivated in gardens. (See illustration, p. 257.)

Caprifolium, genus of twining shrubs of the family Caprifoliaceæ (q.v.). Of this genus, the honeysuckle (q.v.) (*C. Periclymenum* or *Lonicera Periclymenum*) is the most familiar Brit. species. The *C. italicum* or perfoliate honeysuckle, sometimes called *Lonicera C.* resembles the Dutch honeysuckle, which is valued for its fragrance and early flowering. A native of central and S. Europe and naturalised in England, it differs from *C. Periclymenum* in having its upper leaves united at the base so as to form a kind of cup, and it bears whorls of flowers in the axils of these leaves as well as at the extremity of the shoot. Other cultivated species are *C. flavum*, a native of America, which has fragrant yellow flowers; the *C. sempervirens* or trumpet honeysuckle, an evergreen twining shrub also a native of America; and the *C. cilicium*, rather like the *C. italicum*, but with more obtuse and downy leaves; it is the kind most cultivated in France.

Caprimulgide, family of nightjars or goatsuckers, consists of coraciiform birds with soft, owl-like plumage. See GOATSUCKER; WHIR-POOR-WILL.

Caprino, tn. of Italy in the prov. of, and 10 m. W.N.W. from the tn. of, Bergamo, with manuf. of silk. Pop. 7500.

Caprivi de Caprera de Montecuccoli, Georg Leo, Graf von (1831-99), Ger. soldier and statesman. He fought in the campaigns of 1864 and 1866, and in the Franco-Ger. war of 1870 became chief of staff to the 10th Army Corps; he distinguished himself in the battles of the Loire. In 1884 he was made head of the Admiralty, and in 1888 commander of the 10th Army Corps. He succeeded Bismarck in 1890 as chancellor and foreign minister. He brought about a number of negotiations with the Eng. in S. Africa; these were on the whole advantageous to his country, though the colonial party attacked him for relinquishing claims to Zanzibar in exchange for Heligoland. C. passed the Army Bill in 1893 and retired in 1894.

Caproic Acid, or **Hexole Acid** ($C_6H_{12}O_2$), acid found in butter and coco-nut oil. It is obtained from the latter by saponification with caustic potash and distillation

with dilute sulphuric acid. It is a fermentation product of butyric acid. It is an oily liquid of unpleasant odour.

Capros, genus of boar-fishes, occurs in the Atlantic and Mediterranean in rather deep water. *C. aper* is not unlike the dory, but its mouth is more protracile, the body is covered with scales, and the dorsal spines lack long filaments. This species is about 6 in. long, a pale carmine colour above, and silvery-white beneath.

Capsella, genus of N. Crucifere, known in Britain chiefly from *C. bursa-pastoris*, the shepherd's purse (q.v.).

Capsicum, genus of Solanaceæ, which is of economic importance on account of the pepper obtained from some of the species. The shell of the fruit is fleshy, coloured, and contains a pungent principle which also exists in its seed. Both the fruit and the seed of different species are therefore valuable as a condiment, and are used in seasoning food and in the preparation of pickles. *C. annuum*, a weedy plant found wild in S. America and the W. Indies, is greatly cultivated, and its fruit and that of *C. longum* are known to us as chilli or red peppers; dried and ground they form cayenne pepper. *C. frutescens* is an E. Indian shrub with a small fruit, which is called goat-pepper.

Capstan (Fr. *cabestan*; Lat. *capistrum*, a halter; Sp. *cabestrante*), machine used on a ship for manipulating weights, such as anchors. Cs. were originally made of wood, but are now generally made of iron. The axis of this appliance is vertical, differing in this respect from a windlass, which has a horizontal one. The barrel, round which the rope is coiled, is larger at the top and bottom than in the centre, thus allowing the cable to be drawn towards the centre. It is also ridged so that a larger amount of rope may be wound at one time. The drumhead, which is fixed above the barrel, has a number of square holes in it, and the C. bars project from these holes like the spokes of a wheel. At the base of the C. are placed the pawls, or short bars of iron, bolted to the deck by means of the pawl rim. These are to prevent any recoil of the rope. The usual method of working Cs. at the present time is by machinery rather than by hand. Cs. are also used in railway goods yards for shunting trucks.

Capsule, name applied in botany both to dry dehiscent (splitting) fruits formed from more than one carpel and to part of the sporogonium of the Bryophyta, or liverworts and mosses. In the latter case the C., or theca, gives rise to spores, and thus is of importance in the asexual generation of the plants. The capsular fruits are developed from ovaries of which the carpels are fused, and there may be one loculus (chamber) or more than one; the dehiscence, or splitting open, is performed in various ways, and ought to be noted. If the splits run down the midrib of the carpels, e.g. iris, it is called *locuticidal*; if the fruit splits into its various carpels, e.g. rhododendron, *septicidal*; if the outer wall breaks and the seeds remain in the middle, e.g. thorn-

apple, *septifragal*. In the poppy the dehiscence is *porous*, the seeds falling from holes at the top of the fruit, and in the pink the fruit dehiscence by means of teeth. The Cs. of the scarlet pimpernel and the plantain split open by means of a lid; they are examples of *pyridia*.

Capsules, Suprarenal, see SUPRARENAL GLANDS.

Captain, title found in almost all languages to denote a chief of a small band of men (from Lat. *caput*, head, chief). This name is especially applied to a grade officer in the army or navy.

Navy.—Strictly the commanding officer of a man-of-war or of a frigate carrying at least twenty cannon. In the Brit. Navy and most others the C. is next in rank to the rear-admiral or commodore (almost corresponding to an army colonel). This rank was first clearly defined in the Brit. Navy 1747, originating probably from the time when navigating and fighting forces on war vessels were combined. In earlier times the 'master' had charge of the navigation and the fighting was done by soldiers under their military officer. A C. in the R.N. is responsible for military gov., navigation, and equipment of his ship, for the crew's discipline and health, and for neglect of duty in inferior officers. *Post-C.* merely means full C. (from the time when Cs. of large vessels were 'posted' on the permanent list of Cs., from among whom admirals were chosen). A *flag-C.* commands the admiral's ship. The C. of the fleet is a temporary official appointed by the Admiralty to keep up the discipline of the fleet. He acts under a commander-in-chief as adjutant-general of the force, and wears the uniform of rear-admiral. The title is applied by courtesy to all who command ships at sea, whether they hold that rank or not. It is also given to the chief sailor of particular gauges of men in charge of a certain portion of the ship's company, as C. of the 'top,' 'forecastle,' 'hold,' 'gun,' etc.

Military.—In the Brit. Army the commanding officer of a company, troop, or battery, ranking between a major and a lieutenant. This grade is the third in the order of promotion. Formerly the title of an officer of high rank (like the modern colonel), it is now restricted only to the head of a company or squadron. He is responsible for the arms, clothes, discipline, welfare, and efficiency of his unit. The C. also keeps all accounts and reports of the company. He selects the first sergeant, and recommends non-commissioned officers. The title *C.-general* meant chief commander of the army or militia, and is still so used in Spain; also for the governor of Sp. provs. or colonies.

'**Captain**,' ship name in the Brit. Navy closely bound up with Nelson's battles. But the best-known C. is that of the disaster of Sept. 7, 1870. This vessel was a turret ironclad of 6950 tons built in 1869; it capsized in a violent storm off Finisterre and was lost. The first ship of this name was built in 1678, and the following are important battles in which

a C. figured: Beachy Head, 1690; Barfleur, 1692; the battle off Capo Passaro, 1718; Minorca, 1756; Loughsbey, 1758; the Quebec expedition, 1759; Toulon, 1793; Loutham's battle off Genoa, 1795; Hyères, 1795; at Corsica, 1795; Cape St. Vincent, 1797; Copenhagen, 1807; and Martinique, 1809.

Capua, tn. of Italy in the prov. of Caserta, about 17 m. from Naples. It is situated on the R. Volturno, and is a fortified tn. guarding the approach to Naples. Its fortifications were constructed by Vauban, and were enlarged in 1855. The soil round C. is noted for its fertility, producing quantities of fruit. This tn. is the see of an archbishop, and possesses a cathedral, and although a large part of the latter has been reconstructed, some very anct. columns still remain at the entrance. The church of the Annunziata is also noteworthy. The modern C. was built in the 16th century near to the site of the old city of Casilinum, but the anct. tn. of C. was about 3 m. away from this, standing on the site of the modern Santa Maria di Capua. The old tn. was founded by the Etruscans, but in the fifth century B.C. it was conquered by the Samnites. After the battle of Cannæ, 216 B.C., it went over to Hannibal, but was again taken by the Romans four years later. In the fifth century A.D. it was captured and destroyed by Genseric (q.v.) but evidently soon rebuilt. It was eventually destroyed by the Saracens who invaded Italy in A.D. 840. The ruins of its amphitheatre are among the oldest in Italy. Pop. 13,000. During the Second World War the city was bombed by the Allies in Aug. 1943, and subsequently captured from the Gers. by the Allied Fifth Army on Oct. 7, 1943. The cathedral was almost completely destroyed, but part of the apse and side chapels survived, and the bell-tower was slightly damaged. The Rom. bridge was completely destroyed but not much damage was done to the medieval outworks built by Frederick II. The library of the Campano Museum was also badly damaged.

Capuana, Luigi (1839-1915), It. novelist, playwright, poet, and critic, b. at Mineo in Catania. As dramatic critic to the *Nazione* of Florence and other periodicals he wrote the articles which form the volumes called *Studi di letteratura contemporanea, Libri e Teatro*, etc. But C. was at his best as a story-teller and novelist, and particularly when dealing with the world of his infancy and youth. Many of his novels and tales are known in trans. in England, France, Germany, and Russia. Among his best works are *Profil di donne* (1877); *Giocinta* (1879); *Il Profumo* (1890); *L'ascena* (1894); *Il Marchese di Roccarverdu* (1901).

Capuchin Monkey, name applied to either the whole genus *Cebus*, or sapsajous, or else specifically to the individual *C. capucinus*, the weeper. A native of Guinea, it is distinguished by having the hair on the crown and back part of the head black, resembling a monk's hood or cowl, the remainder of the body

being greyish. The genus consists of monkeys which have a completely hairy tail, and a well-developed thumb, and the species are not woolly. They are found wild in S. America and are frequently kept in captivity, especially by organ-grinders. Their diet is chiefly vegetable, but they do not refuse insects and caterpillars.

Capuchins, order of friars in the Rom. Catholic Church, originally a branch of the Franciscans. It was founded by Matteo di Bassi in 1520, who, returning to what he believed to be the true habit of St. Francis, grew a beard, went barefoot, and wore a pointed hood (*capuche*) from which the order takes its name. In 1619 the C. became an independent order. They are numerous, wear a brown habit, and are occupied mainly in missionary labours.

Capulets and Montagues, Eng. names of two legendary noble Veronese families, the Cappelletti and the Montecchi, famous for their rivalry, their hereditary hatred, and bitter feuds. Their story is bound up with the It. traditions of the Middle Ages; both families belonged to the Ghibelline party, and they are referred to by Dante (*Purgatorio*, canto vi.). Shakespeare immortalised them in *Romeo and Juliet*.

Capus, Vincent Marie Alfred (1858-1922), Fr. dramatist and novel-writer, b. at Aix in Provence. He received the education of an engineer, but never followed the profession. His first novel, *Qui perd gagne*, appeared in 1890; it was followed by *Faux Départ* (1891); *Monsieur veut rire* (1893); and *Années d'aventures* (1895). His best-known plays are *Brigol et sa fille* (1895); *Innocent!* (in collaboration with Alphonse Allais) (1896); *Rosine* (1897); *La Veine* (1901); *La Châtelaine* (1902); *Les Deux Écoles* (1902); *Le Beau Jeune Homme* (1903); *Un Anny* (1909); and *L'Arenturier* (1910). C.'s works are pervaded by an optimistic fatalism; they are highly amusing and in general, reflect the life of Paris of his time.

Capybara, or **Carpincho** (*Hydrocharus capybara*), species of rodent of the Caviidae, or cavy family; also known as water-hog. It is the largest rodent in existence, being sometimes 4 or 5 ft. in length; the ears are small, there is no tail, the hair is rough. The anterior limbs are four-toed, while the posterior are three-toed, and all the digits are webbed, with hoof-like nails. It is an aquatic animal and does not move swiftly on land, but is a good swimmer and diver. See **CAVY**.

Caraballos Occidentales, range of mts. in the is. of Luzon in the Philippines. They extend in a northerly direction from the gulf of Lingayen to Mayraira Point. The highest peak is Mt. Data, 7364 ft. The range is complex in character, with a central ridge of spurs.

Carabidae, or ground-beetles, form a family of coleopterous insects, many of which are large and adorned with brilliant metallic colours. They are terrestrial, and few of the Brit. species are capable of flight. About 13,000 distinct members of the family are known to exist. The

larvæ destroy many smaller insects and worms.

Carabine, see **CARBINE**.

Carabineers, or **Carbineers** (from Fr. *carabinier*, soldier armed with a carbine), formerly the name given to all regiments of light horse. Their function was to act as skirmishers and harass the enemy. The name was abolished in the Fr. Army in 1870, and the 6th Dragoon Guards in the Brit. Army obtained the appellation of the C. See **DRAGOON GUARDS**.

Carabobo, state of Venezuela, bounded on the N. by the Caribbean Sea. The prin. port is Puerto Cabello, and Valencia is the chief tn. About 20 m. to the S.W. of the latter place is the small vil. of C., where a battle took place in 1821. Coffee, sugar, and cacao are grown. Pop. 147,000.

Carabus, typical genus of the family Carabidae (*q.v.*), represented in Britain, e.g. by *C. violaceus*, a metallic-coloured beetle. Some species are vegetable feeders, but others eat carrion, and some will attack living snails.

Caracal, tn. of Itumana, in the prov. of Wallachia, 95 m. W. of Bucharest. Its name is derived from the Emperor Caracalla, who in 217 built a tower there, the ruins of which still remain. Pop. 15,000.

Caracal, species of lynx found in Africa and S.W. Asia. It is a reddish-brown, with white under-parts and two white spots near each eye. The ears terminate in a long tuft of black hair. It is savage and powerful. The skin is made into coats by the Kafirs.

Caracalla Marcus Aurelius Antoninus Bassianus (186-217), Rom. emperor, eldest son of Septimius Severus; given the nickname of C. from his introduction of the long Gallic hooded mantle. He accompanied his father to Britain (208-11), and in 211 became joint emperor with his brother Geta, whom he murdered, thus becoming sole emperor (212). Amongst the friends of Geta who also perished was Papinian, the jurist. His reign was a series of cruelties and extortions. His 'Constitutio Antoniana' extended full citizenship to all free inhab. of the empire, merely so that he might get money from the provs. C. was murdered on a plundering expedition against the Parthians, at the instigation of Macrinus, who succeeded him. He built at Rome the Thermae Caracallae or Antoniniane, and the triumphal arch of Septimius Severus. See Gibbon's *Decline and Fall*, chap. vi., Meiser's *Dissertatio de Caracalla*, 1792.

Caracara, or **Carancho** (*Falco taurus*), carrion-hawk of the family Falconidae, and common to America. The bird is a powerful flyer and a good walker. Its nest is sometimes built in trees and sometimes on the ground, and the eggs are three or four in number. It feeds on carrion and also on young animals which it captures alive.

Caracas, tn., the cap. of Venezuela. It lies in a vale of the Andes not far from its port, La Guaira. The soil is fertile, the water supply good, and the climate healthy, owing to its being about 3000 ft.

above the sea level. It has broad and well-built streets, while among its notable buildings are the cathedral, univ., gov. buildings, museum, and library. C. has been sev. times shaken by earthquakes, and that of 1812 destroyed 12,000 of the inhab. It is not a large manufacturing city, but is an important commercial centre. It was burnt down by the Eng. in 1596. Pop. 267,000; with suburbs, 377,000.

Caracci, or **Carracci**, name of three It. painters who founded the 'eclectic' school of painting in Bologna in the sixteenth century. A sonnet written by Agostino makes clear their ambition; they were to combine Michelangelo's power, Titian's 'truth and nature,' Correggio's 'purity of style,' and Raphael's symmetry. This movement was a reaction against the artificial mannerisms which had sprung up in the declining art of Italy; close observation of nature was to be a fundamental principle of the eclectic painters.

Ludovico Caracci (1555-1619) was the founder of the school, but finding that he could not carry out his plan without help, he persuaded his two nephews, **Agostino** (1557-1602) and **Annibale** (1560-1609), to join him. The three opened an academy in Bologna, which they maintained together for three years. Agostino, who had prepared himself by study under Pontana and then in Parma and Rome, was esteemed as an engraver as well as a painter. Annibale left Bologna at the invitation of Cardinal Odoardo Farnese, who commissioned him to decorate his palace in Rome. Here Agostino joined him and assisted in the work till the two brothers quarrelled and finally separated. 'Sussannah and the Two Elders,' in the National Gallery, London, is a fine example of Ludovico's work. Agostino's masterpiece is his 'Communion of St. Jerome' (Bologna), while Annibale's work is well represented by 'Silenus gathering Grapes' (National Gallery).

Caraccioli, name of an anct. noble Neapolitan family, the most distinguished members of which were Gianni, Marino, Domenico, and Francesco.

Gianni Caraccioli (1480-1550), prince of Melfi and grand seneschal of the kingdom of Naples. He was on the Fr. side (except for a short interval) after the conquest of Naples by Charles VIII. For his gallant defence of Luxemburg in 1543, Francis I. rewarded him with the rank of marshal.

Marino Caraccioli (1169-1538), cardinal and statesman, created duke of Milan by Charles V.

Domenico Caraccioli (1715-89), statesman and economist; ambas. successively at Turin, Paris, and London. He d. as viceroy of Sicily.

Francesco Caraccioli (1748-99), admiral. He served in the Brit. Navy, then had command of a Neapolitan squadron. In 1798, when Naples fell into the hands of the Fr., he entered the service of its new Gov. After the battle of the Nile the coast of Naples was drawn into the war against France and the king and queen of Naples took refuge in Palermo under the

protection of Nelson. When Suwarrow drove the Fr. out of Italy again, the king and queen re-entered Naples on the faith of a treaty which amnestied their 'revolted' subjects, among whom was C. Nelson declared the capitulation of Naples null and allowed the vindictive creatures of the court to wreak vengeance on disarmed enemies and gave his sanction to the execution of C., who had served in the rebel cause only under compulsion, and C. was hanged on Nelson's ship (1799).

Caractacus, or **Caratacus**, Celtic hero, son of Cunobelinus, king of the Trinobantes and tribes of S.E. Britain, led the resistance to Rom. invaders under Claudius, A.D. 48-51. After the Roma. captured Camulodunum he retreated, but kept up the struggle till defeated in battle, 51. Betrayed by the queen of the Brigantes to the Roma., C. was sent to Rome, where he apparently d. Claudius rewarded his courage by granting him his liberty. The name survives in the Welsh *Caradoc*. See Tacitus, *Annales*, xii. 33; *Historiae*, iii. 45; Dio ix. 19-22.

Caradoc Formation, upper of the two strata into which the Lower Silurian rocks are divided. The name is derived from Caer Caradoc in Shropshire, which is an outcrop of the formation. The rocks are mainly sandstone, and are estimated to attain a thickness of 2500 ft.

Caradori-Allan, Maria Caterina Rosalbina (1800-65), lt. singer, b. at Milan. After singing in France and Germany, she came to London in 1822, appearing in *The Barber of Seville*. She was popular as a concert singer; she went to Venice and sang there for a season, returning to England, where she settled in 1830.

Caraffa, name of a famous Neapolitan family of which the following may be mentioned:

Oliviero (1406-1511), made a cardinal by Pope Paul II. in 1467, and legate to Alfonso of Naples by Sixtus IV. He was also admiral of the fleet in 1472 and captured Smyrna and Satalia from the Turks.

Giovanni Pietro (1476-1559), became Pope Paul IV. (q.v.).

Carlo (1517-61), nephew of Giovanni Pietro. After serving under the Spaniards in the Netherlands, he was made a cardinal by his uncle, who was then pope. As a result of the latter's favours to his nephews, war ensued with Philip of Spain, in which the C. family was victorious. When Pius IV. succeeded Paul IV. as pope, his hostility to the Cs. led him to bring about the death of Carlo in 1561. Giovanni, a brother of Carlo, shared to a lesser extent in both his brother's good and bad fortune; he was imprisoned by Pius IV., after having been appointed commander of the papal forces by land and sea, and was executed in 1561 on a charge of murdering his wife.

Antonio (1538-91), cousin of Carlo and Giovanni, was made a cardinal; his activities were literary, and among his labours may be mentioned the revision of the Bible, an exposition of the canons of the Council of Trent, an ed. of the *Septuagint*, etc.

Antonio (d. 1693), later member of the family, distinguished himself in the service of Austria, and became a field marshal. He was made governor of Hungary in 1685, but became an object of execration by his cruelty in the affair of the Tekeli conspiracy, and was recalled in 1687. Later he was largely instrumental in conquering Transylvania for Austria.

Caragiale, Ioan (1852-1912), Rumanian author and playwright, b. at Ploiesti in the com. of Margineri. His works are popular in Rumania, and include comedies and novels. His comedies are satirical; the best known of them are *Noctea furtunosa* (*A Stormy Night*) and *Scrisoare perduta* (*The Lost Letter*). In his greatest piece, *Napasta* (*Contempt*), he attained genuine tragic horror. Later in his life he wrote a number of short stories admirable for their psychological observation.

Caraglio, Giovanni Jacopo (c. 1500-51), It. engraver, b. either at Verona or Parma. His engravings—a large number of which are after Raphael—place him high in his profession. He also devoted a great deal of his time to the cutting of precious stones.

Caramania, or Karamania, region comprising most of the E. portion of the central tableland of Asia Minor, lying mostly within the prov. of Konia. It has obtained its name from the tn. Caraman, at the N. foot of Mt. Taurus.

Carambola, or Caramba (*Averrhoa Carambola*), species of Oxaliaceae. It is found in tropical Asia, and is cultivated on account of its acid fruit, which has a pleasant flavour and is about the size of an orange. The fruit is often called the Coromandel gooseberry.

Caramel, substance produced by the application of heat to loaf sugar. When sugar is gradually heated and stirred constantly, it loses water and other substances. At the temp. of 220° C., the liquid which has been formed becomes frothy; it is maintained for some little time at this temp., and then poured out to cool. The solid thus produced is a dark-coloured brittle mass, with a characteristic smell and a persistent bitter taste. It is used for artificially colouring many things, such as beer, vinegar, gravy. The name is also given to a popular kind of sweetmeat.

Caran, see COURLAN.

Caran d'Aohe, see POIRÉ, EMMANUEL.

Caranco, see CARACARA.

Carangamite, or Corangamite, salt-water lake in Victoria, S. Australia, with an area of 76 sq. m., and a circumference of 90 m. It has no outlet, and is shallow on the S. side.

Caranx, see HORSE-MACKEREL.

Carapa, genus of Meliaceae, the order to which belong the trees yielding mahogany and the falsely named cedar-wood (*Cedrela*). The species are tropical and *C. moluccensis* inhabits muddy swamps. *C. procera* and *C. guianensis* both yield oil from the seeds.

Carapace, protective covering of many animals, particularly the arched bony plate which is characteristic of the

Chelonia (e.g. tortoise), and to the shield which protects the fore parts of the Crustacea (e.g. crab).

Carapegua, tn. of Paraguay, situated 37 m. S.E. of Asunción. It has schools and modern public buildings. The surrounding country is fertile, cotton, tobacco, sugar-cane, etc., being grown. Pop. 13,000.

Carat (Arabic *qirāt*, pod; Gk. *κερατιον*, fruit of the carob-tree), originally the name given to the seeds of the African tree of the genus *Erythrina*. These seeds, which were almost always of equal weight, were used first for weighing gold, and later for diamonds. The C. in gold, is one-twenty-fourth part of a certain weight (such as lb. or oz.) troy, as the gold is divided for the purpose of designating the amount of alloy mixed with the metal. Thus in twenty-two C. gold there are two twenty-fourths alloy. With regard to diamonds the C. is a fixed weight.

Caratacus, see CARACTACUS.

Carausius, Marcus Aurelius Valerius, Rom. soldier, b. in Gaul during the third century. He was given a command in the Rom. army, but was suspected of trying to enrich himself by encouraging the pirates. Being sentenced to death, he retired to Britain, usurping the title of emperor, and the Emperor Maximian was eventually compelled to recognise his rule there. He was assassinated in 293.

Caravaca, tn. of Spain in the prov. of Murcia, situated on the C., a trib. of the R. Segura. It is noted for its wine and brandy. There are also manufs. of woollen goods, leather, paper, soap, and oil. Marble is quarried in the hills near by, and there is a stalactite cavern at Barquilla. Pop. 18,000.

Caravaggio, tn. and com. of Lombardy, Italy, situated on the Gera d'Adda, in the prov. of Bergamo. It is 3 m. S.E. of Treviglio, 16 m. S. of Bergamo, and 24 m. N.E. of Milan. The church, L'Apparizione della Madonna, is famous for its paintings, and for the pilgrimages made thither. Pop. 7000.

Caravaggio, Michelangelo Amerighi, or Merigi, da (1569-1609), It. painter, b. at Caravaggio. He was originally a mason, and prepared plaster for frescoes. He studied painting without tuition, and his early works were attacked by his fellow artists. He was himself passionate and of a savage disposition, and these characteristics influenced his pictures. He painted from nature, defying all traditions and principles in art. Many of his scenes are of a violent nature, depicting quarrels and murders, and notable for their deep shadows and high lights. There are numerous pictures of C. distributed over Europe, his masterpiece being 'The Entombment of Christ,' in the Vatican.

Caravaggio, Polidoro Caldara da (1495-1543), It. painter, b. at Caravaggio. He was first employed to carry mortar for the artists, but Raphael noticed his ability, and he was taught to paint. After the sack of Rome he fled to Naples and then to Messina, where he amassed a large

fortune. He was robbed and murdered at Messina. One of his best-known pictures is 'Christ bearing the Cross'.

Caravan and Caravan Trade (Persian *karwan*, from *kāra*, people, army), name in N. Africa and the E. for large companies of merchants, pilgrims, or others travelling together for security, especially across the deserts. From the very earliest times Cs. have been the chief means for transfer of merchandise in Asia. There are frequent references to them in the Bible (Gen. xxxvii.; Job, Isa., Ps.). Camels are largely used for transport of heavy goods, especially in arid, sandy regions, as their powers of endurance are so great. Some Cs. have as many as 1000 camels and mules, but from 400 to 600 is a more usual number.

before starting. He acts as general manager, spokesman, and arbitrator; but in the matter of trafficking, each member of the C. acts independently. In Arabia *kibb*, or *Qāfla*, is the equivalent of C. Other forms are *carouan* and *carrauan*. The word does not occur in Eng. before the late sixteenth century. The trade between Tripoli and the interior of Africa, between Darfur and Egypt, between Russia and China, used to be mainly carried on by Cs. The old Arab trade routes led to Egypt, Syria, and Mesopotamia; and between the eight and eleventh centuries A.D. Arab traders appear to have gone regularly as far as the Baltic. Many old Arabic coins have been discovered in N.W. Europe and in the Brit. Is. The pilgrim bands to Mecca should properly



A CARAVAN ON THE GOBI DESERT

E. N. A.

Those are harnessed in strings of about fifty, following each other in single file, the leader being gaily adorned with trappings and bells. An unladen ass heads the procession, either for luck or guidance. In rocky, steep parts, mules and asses are employed for burdens. Heavy Cs. are those in which the camels have a load of 500 or 600 lb., going about 18 to 20 m. a day; in light Cs. they only have half that weight, and go about 22 to 25 m. a day. The ordinary seasons for trade Cs. are spring, early summer, and later autumn, Friday being the favourite day for the start. Each day's march has two stages: from about 3 to 10 a.m., and again from 2 to 7 p.m. There are often halts of a few days, arranged (together with the exact line of route) by common consent, unless a guide or military officer has been engaged to settle all such points. The five stated daily prayers of the Muslims are made to coincide as far as possible with the necessary halts. Many of the company ride, if possible, on horseback. All are armed, and they sometimes have a military escort. The leader of the trade C. is called *Karwan-Bashi*, or *Rais* (chief), and is chosen by the merchants

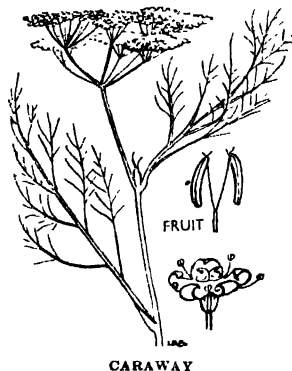
be called *Haji*, not Cs. The two chief start yearly, one from near Damascus (gathering up bands from Anatolia, Kurdistan, Irak, and Syria), and one from Cairo. After 1908 a railway was opened between Damascus and the Hejaz. Other smaller pilgrim Cs. are the N. African, Persian, Nubian, Indian, and Malay, and S. and E. Arabian. The leader of the Mecca Cs. is called *Emir-el-Hadj* (prince of the pilgrims). The Meccan C. from Damascus used to be under the protection of the sultan of Turkey, and consisted of thousands of pilgrims. Of late years a new type of passenger couch has been employed for use on the desert C. route between Bagdad and Damascus. It is over 20 yds. in length, carries between thirty and forty passengers, and is driven by motor engine. Some 30,000 passengers and 12,000 tons of freight traverse the Syrian desert annually and many new routes have been opened up. The great Indian C. from Muscat has been discontinued long ago. An important trade route starts from Timbuktoo, dividing later into two roads, one to Tendruf and S.W. Morocco, one to Taflet in S.E. Morocco. There are

numerous other routes, as from Trebizond to Tabriz; across the deserts of Gobi (Asia) and Sahara (Africa). Horses, yaks, and sheep are used as well as camels and mules in different parts; also dogs, reindeer, and llamas. A fleet of Turkish or Russian ships (especially of merchant vessels and their convoy) is termed a C. The name is also applied to a covered cart, now usually a house on wheels, as a gipsy C.; and to two-wheeled trauilers drawn by a motor car for camping and touring. See Sir R. F. Burton, *Pilgrimage to El-Medinah and Meccah*, 1855; W. J. Junker, *Travels in Africa*, 1890; C. M. Doughty, *Wanderings in Arabia*, 1908; M. Rostoutzeff, *Caravan Cities*, 1932.

Caravansary, or **Caravanserai**, kind of unfurnished inn where the caravans are put up in E. countries. They are large quadrangular buildings with a spacious court, often containing a well in the middle. There are public and private Cs., the former of which are in some cases free.

Caravel, sailing boat of Portuguese origin, having three or four masts; much used by navigators of the fifteenth and sixteenth centuries. The oldest forms were entirely lateen rigged, the foresail being the largest; subsequent types had square sails fitted to the foremast. Another characteristic feature was the square stern.

Caravellas, seaport of Brazil, in the prov. of Espírito Santo. It is a centre of the whale fishery of the Abrolhos is. Pop. 8000.



Caraways, ripe fruits of *Carum Carui*, or *Carvi*, a plant of the order Umbelliferae. The seeds, as they are vulgarly called, are the furrowed halves of the fruit, and their aromatic flavour makes them valuable to confectioners. They are also used as a carminative in medicine, liqueur is distilled from them, and the roots themselves are sometimes eaten in N. Europe.

Carayon, Auguste (1813-74). Fr. author. b. at Saumur. He joined the Society of Jesus, and from that time almost all his work was in connection with the

society. He edited the *History of the Jesuits of Paris*, by Père Garaisio. Among his works may be mentioned *Banishment of Jesuits from Louisiana* (1855); *Undated Documents concerning the Company of Jesus* (1863-75); *Historical Notes on Jesuits and the Parliament of the Eighteenth Century*, (1867).

Carballo, tn. of Spain, in the prov. of Corunna, 22 m. S.W. of that tn. It is noted for its baths and mineral springs. Pop. 15,000.

Carbamide, see UREA.

Carbamines, see ISOCYANIDES.

Carbazotic Acid ($C_6H_5(NO_2)_2 \cdot OH$), or **Picric Acid**, crystalline acid used in dyeing and as a high explosive under the name of lyddite or mellinite. See PICRIC ACID.

Carberry Hill, situated in Midlothian, Scotland, 7 m. S.E. of Edinburgh. It is noted in hist. as the place where Mary Queen of Scots surrendered to the confederate nobles in 1567.

Carbides, compounds of carbon with other elements. Many were unknown until they were prepared by H. Moissan in the electric furnace. The prin. C. are those of calcium, manganese, iron, aluminium, chromium, barium, strontium, lithium, etc. Of these the most important commercially is calcium carbide, much in demand for the production of acetylene, which is generated by bringing water and calcium carbide into contact (see ACETYLENE). Acetylene may be obtained in a similar way from lithium carbide. Other C., as aluminium and beryllium carbide, give methane, while manganese carbide gives methane mixed with hydrogen. Silicon carbide is a stable compound prepared by heating sand and coke in the electric arc; on account of its hardness it is used as a substitute for emery. Silver carbide and cuprous carbide are highly explosive.

Carbine, or **Carabine** (from Fr. *carabine*; corruption from O.F. *calabre*, from Med. Lat., *calabra*, an engine of war), fire-arm carried by horse-soldiers, usually attached to the saddle. It is shorter and smaller than the normal rifle. See CARABINEER.

Carbinol, see METHYL ALCOHOL.

Carbinol, Ethyl, see PROPYL ALCOHOL.

Carbo, Gaius Papirius, Rom. orator, a colleague of Tiberius Gracchus, and one of the chiefs of the democratic party. He was suspected of the death of Scipio Aemilianus. On being made consul after the death of Caius Gracchus, he seemed to change his opinions in favour of the aristocracy. He was now execrated by the populace, and on being accused by Crassus, the tribune, of peculation, he committed suicide in 119 B.C.

Carbo, Gnaeus Papirius, Rom. general who was b. about 130 B.C. He was one of the chiefs of the party of Marius, and was three times elected consul. When beaten by Pompey he fled to Sicily, where he was taken prisoner and killed in 82 B.C. After his death Pompey had his head cut off and sent it to Sulla.

Carbohydrates, see under FOOD AND FEEDING.

Carbolic Acid, Phenol, or Hydroxybenzene (C_6H_5OH), coal-tar product, formerly much used as an antiseptic. It was discovered in coal-tar by Runge in 1834, and has since been observed in the urine of certain animals. For commercial purposes *C. A.* is prepared from the fraction of coal-tar distillate which comes over between 150° and 200° C. This distillate is treated with caustic soda, which dissolves it out together with other substances. Water is then added, which precipitates some of the hydrocarbons; the solution is afterwards treated with sulphuric acid, when the phenols form an oily layer on top of the liquid. The layer is carefully removed and subjected to fractional distillation to separate the phenols. *C. A.* is manufactured for military and other purposes by fusing sodium benzene sulphonate with caustic soda. *C. A.* has a peculiar and characteristic odour, a burning taste, is poisonous, and has antiseptic properties. It crystallises in colourless rhombic prisms which melt at 43° C., and have a boiling point of 182° ; its sp. gr. at the melting point is about 1.066. At ordinary temps. it is moderately soluble in water, but it dissolves readily in alcohol, ether, glacial acetic acid, and glycerol. Upon exposure to light and air it deliquesces and assumes a red colour, but its other properties are apparently unaffected. Tests for *C. A.* are provided by the fact that it gives a violet colour with ferric chloride, and produces a white precipitate with bromine water. *C. A.* decomposes at a very high temp., benzene, toluene, naphthalene, and other substances being formed. Though called an acid, it is neutral to the usual tests, but forms salts called phenoxides or phenates. The phenates of the alkali metals may be prepared by dissolving the acid in a solution of alkali caustic with the exclusion of air. Phenol forms many substitution products, chlorine and bromine readily forming chlorophenols and bromophenols. It is used commercially for the manu. of artificial colouring matters, explosives, plastics, dyes, aspirin, etc.

Therapeutics, etc.—*C. A.* is a general germicide, and is used to exterminate such fungoid growths as ringworm. When used in concentrated form it acts at first as a caustic, and afterwards produces local anaesthesia, which is maintained for some hours. It is readily absorbed by the unbroken skin, and may be used to treat a collection of septic matter near the skin surface, but its absorption in this way may produce symptoms of poisoning. A little cotton-wool soaked in *C. A.* often relieves toothache caused by decayed teeth. Internally, *C. A.* is taken in doses of $\frac{1}{4}$ to 2 grains, and is useful in fermentation in the stomach and as an intestinal antiseptic; it is occasionally used to stop vomiting.

Poisoning.—Phenol is a nerve poison, and, in concentrated form, a strong caustic. A quantity of 15 grains provides a very dangerous dose. The effects of the caustic may at once be seen at the mouth, tongue, and throat. As a

nerve poison, it produces paralysis of the respiratory centres, the breathing becomes shallow, a condition of collapse sets in, the patient is cold and clammy, and a state of coma precedes death. Diagnosis of poisoning by absorption is made by observing the condition of the urine, which assumes a characteristic dark green colour. Treatment includes getting rid of the poison remaining in the stomach, administering an antidote, and treating collapse. The removal of the poison must be carefully effected by means of the soft siphon, as the use of the stomach-pump is impossible on account of the probably injured state of the stomach lining. The usual antidote is sodium sulphate introduced either by the mouth or by intravenous injection; the action probably is that the phenol is converted into sodium sulphocarbonate, which is innocuous. Collapse should be treated by administering brandy, by placing hot-water bottles at the extremities, and by generally preserving the warmth of the body by the use of hot blankets.

Carbon, symbol *C*, atomic number 6, atomic weight, 12.01, non-metallic element of widespread distribution. It occurs in nature in practically a pure state as diamond, and a somewhat less pure state as graphite or plumbago. In combination with oxygen, it occurs in the atmosphere to a small extent, and in combination with metals, notably calcium, forms many important rocks. More important still, however, is its occurrence in every form of animal and vegetable life, and so many different compounds of *C.* are met with in living tissues that the study of them is set apart as a special section of the science of chem. under the title of organic chem., which might therefore be rendered chem. of the *C.* compounds. *C.* as the chief constituent of vegetable tissues has another special significance, as the proportion of *C.* determines the characteristic properties of those substances considered as fuel. Thus dry wood contains about 50 per cent of *C.*; peat, or vegetable matter partly decayed, contains about 58 per cent, if moisture be disregarded; brown coal contains about 66 per cent, excluding moisture; bituminous coal contains about 84 per cent, and anthracite contains sometimes 95 per cent of *C.* The extent to which the plant matter has been allowed to part with its gaseous constituents therefore determines the percentage of *C.*, and the heating power of a coal-like fuel and the extent of freedom from smoke increases with the proportion of *C.* Where the decomposition of the plant tissues proceeds with the elimination of all the oxygen, the resulting product is bitumen, and large deposits of this substance occur in many parts of the world. **Diamond** is a crystalline form of *C.* It is usually found as octahedra or cubes, but many modifications exist. It was first discovered to be a form of *C.* by Smithson Tennant in 1797, who succeeded in burning the substance in fused nitre and demonstrated the products of combustion to be *C.* dioxide only. The diamond owes its economic value to its excessive

hardness and great brilliance. It is found chiefly in S. Africa and S. America. *Graphite*, blacklead, or plumbago, is a mineral occurring in beds or plates amongst the older crystalline rocks, as in Cumberland, the Laurentian mts., Spain, Bohemia, and elsewhere. It is also artificially produced in electric furnaces, and the greater portion of the raw material for the manuf. of writing pencils is now obtained in this way. It is a dark grey or black mineral with a metallic lustre, and possesses a peculiarly greasy softness, so that it leaves a mark on anything with which it comes fairly forcibly in contact. Besides its use for the manuf. of writing pencils, it is commercially important as a dry lubricant. *Amorphous C.* is obtained by burning many kinds of animal and vegetable tissue in a limited supply of air. C. does not readily enter into chemical composition except at high temps., and it is only when oxidation is rapid that C. burns to form C. dioxide. *Lampblack* is a form of C. prepared by burning tar, resin, or turpentine, and condensing the products of combustion. The C. thus collected is a densely black substance with impurities of hydrocarbons. It may be purified by heating in closed vessels, when a fairly pure form is obtained. Its most important property is that it does not reflect light from any angle and it is therefore in demand as a black pigment and as a constituent of printer's ink. *Gas C.* is a particularly hard and dense form obtained in the distillation of coal in gas-works, apart from the porous form known as coke. Gas C. is a bad conductor of electricity, and is used for the manuf. of rods for electric arc lights. There are various forms of charcoal obtained by the slow combustion of animal or vegetable matter. Wood charcoal is obtained by burning wood in a limited supply of air. The old method practised by the charcoal-burners of the forests of Europe from time immemorial consists in collecting branches of suitable length and thickness into heaps, which are closely packed in and then covered over with turf. The wood is ignited at the top and sides and allowed slowly to burn towards the centre, the charcoal-burner inspecting the heap from time to time to see that the combustion is regulated by a proper adjustment of the scanty air-holes at the base. Charcoal thus prepared is used as a fuel and as a reducing agent in smelting ores. *Animal charcoal*, or bone black, is obtained by distilling bones in iron retorts. It is usually very impure, but possesses considerable decolorising and absorbent powers, and is used for the purpose of decolorising raw sugar. Charcoal varies in its properties according to the structure of the substance from which it was prepared and the mode of preparation. It has the power of absorbing gases, being capable of absorbing such quantities that they must be in a state of compression analogous to the liquid state. It is to this property that charcoal owes its value as a deodoriser, its affinity for ammonia in particular being very marked. The practice of eating charcoal in the form

of charcoal biscuits is based on the expectation that gases causing pain and inconvenience in the stomach and intestines will be thus absorbed. *Active charcoal*, an even better absorbent, is made from ordinary charcoal, peat, or coal by various methods, e.g. by heating first with phosphoric acid, charring, and washing. It is used in respirators, for removing fusel oil from crude spirit, for recovering volatile solvents in dry-cleaning works, for decolorising sugar syrup, etc. Charcoal is used as a reducing agent in the laboratory to separate a metal from its ore. Charcoal, as has been said, is not chemically active at low temps., but at high temps. it combines readily with oxygen in an oxide, giving off C. dioxide, while the metal is extracted pure. Before the widespread use of coal in iron-furnaces, wood charcoal was commonly used to reduce the ore, and the process is still used where coal is scarce, as in Sweden. The compounds of C. are numerous and important. With oxygen two prin. compounds are formed. C. dioxide (CO_2) is produced whenever C. is burned in excess of air or oxygen. It is a colourless gas, heavier than air, does not support combustion, and is soluble in water, the solution having an acid reaction (see CARBONIC ACID). When wood or coal is burnt without sufficient excess of air, C. monoxide (CO) is produced, as in blast-furnace operations, etc. It is a colourless, tasteless gas of a poisonous nature (see CARBON MONOXIDE). C. dioxide in association with water acts as a dibasic acid, which forms two series of salts with metals, the carbonates and bicarbonates (see CARBONATES). C. is also capable of combining with metals directly in the electric furnace, giving rise to compounds called *carbides* (q.v.). It also combines directly with hydrogen when an electric arc is estab. between C. poles in an atmosphere of hydrogen. The resulting product is *acetylene* (q.v.). C. unites with fluorine to produce C. tetrafluoride (CF_4). When heated in sulphur vapour, C. unites with sulphur to form C. bi- or di-sulphide (CS_2), a very volatile, colourless liquid, boiling at 46°C . and giving off an inflammable vapour. It has remarkable solvent powers, dissolving fats, India-rubber, sulphur, iodine, and phosphorus, which are otherwise difficult to obtain in solution. C. oxysulphide (COS) is a colourless, odourless, inflammable gas, produced when C. monoxide and sulphur vapour are passed through a tube at a moderate heat. *Carbonyl chloride*, or *phosgene* (COCl_2), is a colourless, heavy gas with a pungent smell, prepared by the action of sunlight on C. monoxide and chlorine. It is very poisonous. C. and hydrogen unite in many different proportions, giving rise to bodies which are collectively known as *hydrocarbons*. The many other compounds of C. with oxygen, hydrogen, and nitrogen which are associated with forms of living matter are usually classed as organic compounds; their number seems to be without limit, for not only have new compounds been isolated through the efforts of chemical research workers, but hitherto

unknown substances have been synthesised in the laboratory. See also ALCOHOL, ALDEHYDES, FAT, STARCH, SOAP.

Carbonado (Sp., coal), form of carbon. It is black in colour, is found in pieces as large as the ball of the thumb, and is sometimes used for the boring of rocks.

Carbonara, tn. of Italy in the prov. of, and 4 m. from the tn. of, Bari. Pop. 10,000.

Carbonari (It., charcoal-burners), members of an It. political secret society, which appears to have been formed in the first instance by Neapolitan republicans during the reign of Joachim (Murat). It had for its objects the expulsion of strangers from the throne of the country and the estab. of democracy. Its ritual was taken from the trade which gave it its name; thus a lodge of the society was a *baracca*, or hut, an ordinary meeting was called a *rendita*, or sale; an important meeting an *alta rendita*. Mystic religious language was used to explain the aims of the society, 'clearing the wood of wolves' was said to be their aim, alluding to Christ as a lamb torn by wolves. The objects of the society were at first only the expulsion of foreigners, but members of the higher degrees soon became democratic and then anti-monarchical. There were four grades in the society, which practised mystic rites of initiation. The C. rapidly increased in numbers, and by 1820 included many of the most intelligent patriots in Italy. After the suppression of the Neapolitan and Piedmontese revolutions of 1821, Carbonarism was made high treason. After 1821 the C. never quite revived in Italy, and, though active again in 1830-31, they were superseded by the more extremist 'young Italy' of Mazzini.

Carbonates, salts of carbonic acid. Carbon dioxide dissolves in water to form a feebly acid solution, and therefore carbon dioxide is regarded as the anhydrous (i.e. without water) form of carbonic acid, H_2CO_3 , which, however, has never been isolated. The acid is dibasic, that is, it contains two atoms of replaceable hydrogen per molecule; when both atoms are replaced by a metal, the product is a carbonate, and when one atom only is replaced, the product is an acid carbonate, or bi-carbonate. The univalent alkali metals, such as sodium and potassium, yield both C. and acid C. with the general formulae $M(CO_3)$ and $MH(CO_3)$. The C. of sodium, potassium, and thallium are soluble in water, all the others are insoluble. Aluminium and chromium do not appear to yield C., and magnesium, bismuth, and copper yield basic C. If an acid be added to a carbonate, effervescence takes place with evolution of carbon dioxide, and most C. are decomposed by heat into carbon dioxide and the oxide of the metal.

Carbonale, city of Pennsylvania, U.S.A., in Lackawanna co., situated on the Lackawanna R. It is in the midst of the anthracite coalfield of the U.S.A. There are foundries and a trade in timber. Pop. 21,000.

Carbon Dioxide, see CARBONIC ACID.

Carbonear, port of Newfoundland, situated on Conception Bay, 4 m. N. of Harbour Grace. Pop. 4000.

Carbonic Acid, term applied to the substance H_2CO_3 , but formerly to the anhydride carbon dioxide CO_2 , or C. A. gas. Carbon dioxide occurs in the atmosphere to the extent of three to four volumes in 10,000, though in tns. the amount may be larger. It occurs also in solution in riv. and sea water, being carried down by rain or liberated from decomposing carbonates in the soil. The gas is produced in large quantities in lime kilns, being formed by the decomposition of the chalk or limestone from which the chalk is made. Fermentation and putrefaction give rise to carbon dioxide, which may exert considerable pressure if the processes are carried out in closed vessels. In the laboratory, carbon dioxide is prepared by treating marble or chalk with dilute hydrochloric acid, but it may generally be stated that all carbonates when treated with most acids yield the gas. Carbon dioxide is a colourless gas about 1.5 as heavy as air, moderately soluble in water; it liquefies at $0^\circ C.$ under a pressure of thirty-six atmospheres. The 'snow' form can be compressed into blocks and such solid has in air, i.e. at one atmospheric pressure, a temp. of $-78^\circ C.$ It is used in the preparation of aerated waters, quantities being dissolved in water under pressure to produce the sparkling effect when the pressure is at length removed by releasing the stopper of the bottle. Carbon dioxide plays an important part in the making of bread, being generated in the dough by the use of yeast in order to obtain the porous condition which makes bread light and palatable. In the vital processes of animals and plants, carbon dioxide is a necessary factor, for it is a product of the oxidation of waste organic substances occurring in the continuous change of material in the animal economy, and it forms the raw material from which plants obtain the carbon necessary to build up their tissues. Thus plants absorb carbon dioxide and give out oxygen, while animals breathe in air and expel air containing a larger proportion of carbon dioxide. Unless there is adequate ventilation in a room the increasing proportion of carbon dioxide interferes with the proper supply of oxygen to the lungs, and symptoms of suffocation may ultimately appear. Solid carbon dioxide is used as a refrigerant ('dry ice' or 'drikold'), e.g. in the ice-cream and engineering industries.

Carbon Monoxide (formerly **Carbonic Oxide**), CO , a gas formed during combustion when the supply of oxygen is not sufficiently large. It is found in chimney gases, in the gases of blast furnaces, and in the vapours arising from volcanoes. It is prepared in the laboratory by the action of concentrated sulphuric acid on oxalic acid, an equal volume of carbon dioxide also being produced. C. M. is a colourless, odourless gas slightly lighter than air. It is sparingly soluble in water and burns with a pale blue flame to form carbon dioxide; this flame may sometimes

be observed near the top of a coal fire when there is incomplete combustion in the lower part of the grate, or when the carbon dioxide first formed is turned into C. M. by passing over a heated mass of coal. CO is a very poisonous gas, and is particularly dangerous in coal mines, where it is sometimes formed in small quantities. It is, however, non-poisonous to green plants. Mixed with hydrogen, as 'water-gas' prepared by passing steam over red-hot coke, C. M. is largely used as an industrial fuel. 'Producer gas,' a mixture of C. M. and nitrogen made by burning coke in a limited current of air, is also an important industrial fuel. C. M. is the starting point for the commercial synthesis of many carbon compounds.

Carboniferous System, series of stratified rocks which contain the great coal-bearing strata of economic value. The system includes much more than the coal measures, and, on the other hand, coal is found in strata unconnected with the system. The C. S. lies above the Devonian or Old Red Sandstone, and below the Permian or Triassic systems. It comprises in the United Kingdom the lower C. S. or C. limestone, above which lies the millstone grit, and above that the coal measures. The C. limestone may usually be divided into lower, middle, and upper rocks. The lower consists of limestone shales in the S. and centre of England, and calciferous sandstone in Scotland; the middle consists mainly of mt. limestone; and the upper of black shales with thin limestones. The *millstone grit* separates the two great systems, and consists of grits, thin coal seams, and limestones. The *coal measures* may also be divided into lower, middle, and upper. The lower consists of shales, thin limestones, and coal seams; the middle of the prin. coal seams; and the upper of thin limestones and coal seams, sandstones, and clays. In England the greatest thickness is attained in the N. and W.; this is because the land was at the C. period covered by shallow water and received a considerable amount of sediment from the land to the N., while the S. and E. of England lay under some depth of clear water. The thickness of all parts of the system therefore varies considerably with the locality. With reference to the coal measures, these are found to a thickness of 8000 ft. in S. Wales, 6000 in Lancashire, 3000 in the midlands, Durham, and Northumberland, and about 2000 in Scotland. In Ireland the system is represented chiefly by mt. limestone. In Europe the C. rocks appear in Belgium, in France near St. Etienne, in Westphalia, Saxony, and Bohemia. In Russia the system extends northward as far as Spitzbergen, and this is continued through S. Siberia into China. C. rocks are also known in Australasia, N. Africa, and S. America, while in the U.S.A. the system is widespread, attaining its greatest thickness in the E., the beds of greatest economic importance being in Pennsylvania and the surrounding dists. In the C. period as represented by rocks in the

United Kingdom, the sedimentation is of two kinds: marine and continental or lagoonal. In the marine strata the fossils include crinoids, corals, foraminifera, and brachiopods. Remains of many fish are found, including sharks with piercing teeth and others with teeth adapted for crushing crustaceans, etc. In the continental strata are found six great groups of plants, including the club mosses, horse-tails, gigantic ferns, etc. Some of the tree ferns have been so well preserved that the minutest details of their structure can be studied, and some smaller ferns have been identified with still living species. The vegetation appears to have been luxuriant and abundant, and there is evidence that the climate was, if not hot, at least mild and moist; though the beds of coal found in Arctic regions and in the great Antarctic plateau seem to show that the period was exceptionally favourable to vegetation. It has been suggested that, owing to continual volcanic disturbances, of which there is abundant evidence, the air was charged with a greater proportion of carbon dioxide than it has now, so that vegetation was proportionately encouraged. The animals of the continental strata include fresh-water mollusca, ganoids, occasional salt-water fish, spiders, cockroaches, locusts, bees, etc., and in the later C. rocks are found large numbers of early amphibians. The economic importance of the C. S. lies mainly in the coal and oil found in Britain, Belgium, Russia, Japan, and America, but many other products are in continual demand. The C. limestone yields limestone for the manuf. of lime, bleaching powder, etc. The ironstone found in association with the coal, ores of zinc, lead, and antimony found in the limestone are worked. The sandstones are used for building purposes, and for grindstones, millstones, etc. Fire-clay and terracotta clay often occur, and the various shales are treated for the extraction of oil, sulphur, and sulphuric acid.

Carbonisation (Low Temperature). The manuf. of coke from coal has been carried on since the seventeenth century, and the gas industry was founded by Wm. Murdoch in 1792. In the ordinary or high-temp. process for producing gas and coke a temp. of about 1000° C. is maintained, but to produce a fuel, or semi-coke, suitable for use in open grates, and also to obtain a higher yield of liquid products, a temp. of about 600° C.—the so-called low-temp. C.—is resorted to.

In 1850 James Young, the founder of the Scottish shale industry, obtained a patent for the purpose, and in 1906 T. Parker took out a patent for the manuf. of 'coalite.' Numerous investigators have worked on the problem, prominent among them being Sir George Bailey (1850-1924). He studied fuel problems all his life, in particular those connected with low-temp. distillation either of shale or coal, and in 1917 was made chairman (honorary) of the newly formed Fuel Research Board. He hoped that the successful low-temp.

C. of coal would provide home supplies of fuel oil for the navy and mercantile marine, and he designed the National Fuel Research Station at E. Greenwich with this as one of the aims in view. He was responsible also for the introduction of the therm system of charging for company's gas. Sev. difficulties have appeared in connection with low-temp. C., chief among them being swelling of the coal during treatment and low rate of heat penetration. Many types of plant have been evolved to overcome these and other difficulties, though even now coals which can be treated successfully in one type of plant may be comparatively failures in another. This may be modified in the future by pre-treatment of the coal before C. The prin. low-temp. processes are readily divided into three classes: (a) externally heated systems; (b) combined external and internal heating systems; and (c) internally heated systems. All these classes include continuous and intermittent retorts or carbonising chambers.

Carborundum, trade name of a proprietary brand of silicon carbide (SiC). It is manufactured by heating together in an electric furnace sand and coke. It is a black crystalline solid, with hardness greater than that of ruby. Its great hardness makes it invaluable as an abrasive, and leads to its use in place of emery.

Carbuncle, variety of garnet, so called by the ancients, because of its appearance of a glowing coal in certain lights. Cut with concave surfaces it has a dark red colour, but owing to its relative softness it is not very valuable. The best specimens are found in E. Asia, notably Burma and Ceylon, but it is also found in Brazil.

Carbuncle, eruption of the skin similar to a large boil. It is caused by poorness of blood or similar cause, and accompanied by derangement of the liver and kidneys. It appears generally on the shoulder, nape of the neck, abdomen, and sometimes on the leg. It first appears as a hard red patch, and, attacking the subcutaneous tissues, gives rise to local pain. The redness darkens into purple, and small eruptions of matter appear on the surface of the skin, from which the liquid oozes. Simultaneously the skin is killed and comes off as a hard patch. Treatment usually consists in strengthening the patient with light, easily digested food, and stimulating the secretory organs so that the system assumes its normal working order. Poultices of various kinds are used, bathing with an antiseptic wash, and occasionally incision is resorted to, to relieve the place of fluid and prevent excessive loss of skin. Rest in bed is also essential. The eruption is much more serious than an ordinary boil, and medical advice should always be taken.

Carburettor, originally an apparatus for charging gas or air with carbon by passing it through a liquid hydrocarbon, usually with the object of increasing its illuminating power. The word is now used to describe a device attached to an

internal combustion engine, which uses volatile, spirituous liquid fuels, e.g. petrol, benzole. Before the fuel can be burned effectively within the cylinder of the engine, it must be finely broken up into very small particles and mixed with air in definite proportions, depending upon the chemical composition of the fuel: usually for petrol about 15 parts of air to 1 part of fuel by weight. This is the chief function of the C., to pulverise the fuel as completely as possible and to supply it to the engine thoroughly mixed with the correct proportion of air, under all conditions of load variation. In addition, the C. must provide a small reserve of fuel to enrich momentarily the combustible mixture for sudden acceleration or to ensure easy starting. When fixed to aero engines, provision must be made in the C. to alter the mixture strength to suit the conditions met with in the rarer atmosphere at high altitudes.

The earlier Cs. were of the 'surface' type, in which a current of heated air was drawn across cotton wicks saturated with petrol. This method usually resulted in an over-rich mixture, which had to be diluted by extra air before reaching the engine cylinder. The Cs. generally used to-day are known as the spray type, in which the liquid fuel is metered through one or more calibrated jets and discharged into a stream of air moving at high speed through a restricted passage called the choke. The effect of the petrol thus impinging causes it to be broken up and intimately mixed with the air. Liquid fuel reaches the jets from a small reservoir, called a float-chamber, where it is maintained at a constant level by a float which operates a small valve controlling the supply from the main fuel tank. *See also* AERO-ENGINES; MOTOR CARS AND MOTOR CYCLES; GAS ENGINES; INTERNAL COMBUSTION ENGINE.

Carbylamines, *see* ISOCYANIDES.

Carcagente, tn. of Spain in the prov. of Valencia, 25 m. S.S.W. of that tn. Rice is grown, and there is a trade in fruits, grain, and silk. Pop. 14,000.

Carcano, Giulio (1812-84). It. poet and novelist, b. at Milan. His first work was *Angiola Maria*, pub. in 1839. He then, with most other It. authors, took part in the fight for the freedom and unification of Italy, and was obliged to go into exile. On his return he became in 1859 prof. at the academy of Milan and was afterwards appointed senator. He wrote numerous works, best known among which are his novels and collections of short stories: *Racconti Semplici* (1843); *Damiano* (1851); *Dodici Norelle* (1853); his collections of *Poesie edite ed inedite* (2 vols.) (1861-70); and *Poesie varie* (1875); and his tragedies *Spartaco* (1857); *Ardonno* (1860); and *Valentina* (1870). He also trans. Shakespeare into It. (1874-82).

Carcar, tn. on the E. coast of the Is. of Cebu, belonging to the Philippines. Sugar is largely cultivated. Pop. 37,000.

Carcassonne (Rom. *Carcasso*), city of France, cap. of the dept. of Aude, 60 m. S.E. of Toulouse. It owes its fame to the two walls and fifty-three towers

surrounding the 'city,' the finest fortifications in France. The church of St. Nazaire dates from the eleventh to the fourteenth century, the cathedral from the fourteenth. The city was captured by the Visigoths in 418 and by the Saracens in 725. Pop. 35,000.

Mémoire d'une autre vie (1934), and *Envoûtement de Paris* (1938).

Cardale, John Bate (1802-77), a writer upon religious subjects and one of the founders (1835) of the Catholic Apostolic Church, of which he was made first apostle. His more important works are:



D. McLeish

THE 'CITÉ,' WITH ITS DOUBLE ENCEINTE AT CARCASSONNE

Carcharodon, genus of the Lamnidae or mackerel shark family. It includes the largest living shark, 36 ft. in length, which occurs from the Mediterranean to Australia. Technically it is known as *C. carcharias*, popularly as the man-eater or great blue shark.

Carchemish, anc. city on the W. bank of the Euphrates, N.E. of the modern Aleppo, was N. cap. of the Hittites (2 Chron. xxxv. 20). It is identified with the ruined Jerablus (Hierapolis).

Carco, Francis (b. 1886), Fr. writer, b. at Noumen, in the Fr. is. possession of New Caledonia. He went to Paris when quite a young man, and made his début in authorship with his poems *La Bohème et mon cœur* pub. in 1912. His greatest successes, however, have been with his novels and short stories dealing with the Parisian underworld and plentifully sprinkled with Apache argot. One of his best-known books is *Jésus-la-Caille* (1914). Another, *L'Homme traqué*, received in 1923 the grand prize for romances offered annually by the Académie Française. Later books of essays include *Prisons de femmes* (1933);

The Confession of the Church (1848); *The Doctrine of the Eucharist* (1856, 2nd ed. 1876); *Notes on Revelations* (1860); *The Certainty of Final Judgment*, (1864); *The Fourfold Ministry* (1871); and *A Short Sermon on War* (1876).

Cardamine, genus of plants of the order Cruciferae which is widely distributed. The species are usually smooth herbs, with stalked, entire, lobed, or pinnately cut leaves, and racemes of white or red flowers. The commonest Brit. specimen is *C. pratensis*, which bears large lilac flowers and is called by a number of popular names. From its bitter taste it is called bittercress, from its appearance in the spring it is known as the cuckoo-flower, and from its covering the meadows as though linen were bleaching, lady-smock. The flowers yield a bitter, volatile oil of slight medicinal use, and the plants reproduce vegetatively to a great extent. *C. bulbifera* reproduces by axillary bulbils, *C. chenopodiifolia* has two kinds of fruit and *C. impatiens* has an explosive fruit.

Cardamom Hills, range of hills in the prov. of Madras, India; altitude 2000 to 4000 ft.

Cardamoms, fruit of sev. species of Zingiberaceæ from the genera *Amomum* and *Eletharia*. *E. Cardamomum* is an Indian plant in which the rhizome produces leafless shoots, and these bear the fruit which, when ripe, yield the spice C. In the species of *Amomum* the same thing occurs: *A. Cardamomum* is a native of Sumatra. *A. angustifolium* of Madagascar, the one producing small, the other large C. Grains of Paradise are the fruits of *A. granum Paradisi*, and are an inferior quality of C.

Cardan (Cardano), Girolamo (1501-76). It. physician, mathematician, and astrologer, b. at Pavia, illegitimate son of a well-known jurist of Milan. Educated at Pavia Univ. and at Padua Univ., where he took his medical degree. Excluded from the College of Physicians by reason of his birth, his earlier efforts in medical practice were unsuccessful and he was reduced to penury. But through the influence of a Milanese senator, whose child he had cured, he was admitted to the medical fraternity and, in 1534, through the same influence, appointed to the chair of mathematics at Milan. A few years later the pub. of his *Practice of Arithmetic* brought him into notice. This was followed in 1545 by a treatise on algebra, which is noteworthy for its exposition of the principle of cubic equations and the solution of geometrical problems by algebra—for the first of which he was indebted to some extent to his instructor Tartaglia. He had previously to this pub. a work on astrology, which in those days secured him more renown than it would have done in a more sceptical age. In 1551 his fame was established by his chief work, the treatise *De Subtilitate Rerum*—speculation in physical phenomena; and this was followed a few years later by its sequel, *De Varietate Rerum*, in which work too he seeks to explain ordinary physical phenomena, albeit in crude if ingenious manner. But the chief interest of this later work lies in its groping but advanced thought on the inorganic realm of nature, which he suggested was animated no less than organic nature. He afterwards continued the practice of medicine at Pavia and Bologna till 1570. While there he further studied astrology and pretended to cast the horoscope of Christ, for which he was imprisoned. After leaving Bologna he went to Rome, where he d. See H. Morley, *The Life of Geronimo Cardano*, 1834.

Cardboard, thick board made by compressing together sev. leaves of paper pulp in the process of manuf. Pasteboard is a form of C., produced by pasting together sev. sheets of paper. Bristol board is a finer kind of C. used for pen-and-ink drawings. Strawboard is a coarse yellow board made from straw pulp.

Carden, Sir Sackville Hamilton (1857-1930), Brit. admiral, son of Capt. Andrew C. of Templemore, Ireland. Entered the navy as a midshipman and first saw active service in the Egyptian war of 1882. Served in the Suakin operations and in the E. Sudan in 1894. In 1897 served under Sir Harry Rawson in the

Benin expedition, and attained flag rank in 1908. In 1914 he was admiral superintendent of Malta dockyard, and when Sir Berkeley Milne left the Mediterranean Adm. C. became commander-in-chief of that station. He was in command of the naval operations at the opening of the Dardanelles campaign and the destruction of the forts at the entrance, but resigned his command through illness, and was succeeded by Adm. Sir John De Robeck. Created K.C.M.G. in 1916 and promoted full admiral in 1917.

Cardenal, Pierre (d. 1308), Provençal troubadour. He was canon of the cathedral of Puy-en-Velay, his native tn., and his songs consist principally of sirventes, a name given to the satirical songs of the troubadours, dealing with the vices of the nobility and the clergy. The sirventes of C. are extremely forceful. He also supported the Albigenses against the crusade of the Catholics. His songs are to be found in Mahn's *Gedichte der Troubadours*, 1856-73.

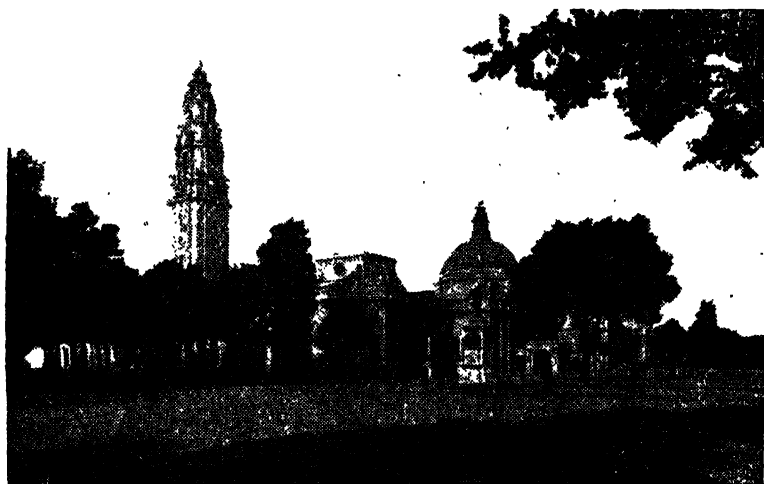
Cardenas, seaport on the N. coast of Cuba, 75 m. E. of Havana, in the prov. of Matanzas. It is one of the chief sugar exporting tns. of the is. It has a good harbour and is well served by railways. Pop. 40,000.

Cardia, opening in the upper part of the stomach by which the œsophagus enters. As its name indicates it is close to the heart.

Cardiff (Welsh *Caer Taff*, or *Caerdydd*, according to some authorities), city of S. Wales, municipal co., and parl. bor., seaport tn. and the co. tn. of Glamorganshire. It stands on the l. b. of the R. Taff, quite close to its mouth. C. has made greater and more rapid progress than perhaps any other tn. in the United Kingdom, and this was begun by the opening of its first dock in 1839. The docks and basins are five in number, among them Bute Docks and the Glamorganshire canal basin. Formerly the property of the marquess of Bute, they are now under state control. C. is an important commercial centre, and has a large coal and iron trade, being connected with the S. Wales coalfield and the dists. of Aberdare and Merthyr Tydvil. It was formerly one of the largest ports in the world for exporting coal, but since 1946 the exports of coal have declined to negligible proportions. It exports also large quantities of iron, manufactured iron, and steel goods, and carries on a considerable industry in ship-repairing. The city itself is a very old one and contains the ruins of a Norman castle of the eleventh century, in which Robert, duke of Normandy, the eldest son of William the Conqueror, remained for twenty-eight years. This castle has been partially restored by its present owner, the marquess of Bute. C. also played some part in the hist. of England during the time of the Civil war. C. is noted for its parks and open spaces. Cathays Park is the civic centre of the tn., and is one of the finest in the world. Here are situated the city hall, notable for its statues of famous Welsh people, the

National Museum of Wales, the Glamorgan co. hall, the Temple of Peace, and the Welsh National Memorial, and other public buildings. C. is also the seat of the univ. college of S. Wales and Monmouthshire and there are various technical colleges. The cathedral of Llandaff is situated 2 m. to the N.W. of the city. The Royal Infirmary, which originated at an elsteddof held at C. Castle in 1834 under the patronage of Princess Victoria, was incorporated in 1923. The city was extended in 1922. The Corporation waterworks cost £2,500,000. C. fortunately suffered little from air attack during the Second World

War. Cardiganshire, co. in S. Wales, washed on the W. by Cardigan Bay. It extends from the mouth of the Dovey to the mouth of the Teifi, and has an area of about 690 sq. m. It is bounded on the S. by Pembroke and Carnarvon, and on the E. by Brecknock, Radnor, and Montgomeryshire. The surface of the co. is composed of Cambrian and Silurian rocks, and the interior is very mountainous. Its culminating point, Plynlimmon, 2400 ft. high, lies in the N.E. of the co. The most important rivs. of C. are the Teifi, the Rheidol, with the Rheidol Falls spanned by the Devil's Bridge, the Ystwith, the Aeron, and the Towy.



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CARDIFF: CITY HALL AND THE NATIONAL MUSEUM OF WALES

War, and the docks and commercial parts were undamaged. The city sends three members to Parliament. Pop. (estimated 1947) 230,000.

Cardigan, James Thomas Brudenell, seventh Earl of (1797-1868), Eng. soldier, b. at Hambledon in Hampshire, and served in the Crimea, during which campaign he led the famous charge of the Light Brigade at Balaclava (1854). Afterwards inspector-general of cavalry (1855-60).

Cardigan, seaport tn., a municipal bor., and the co. tn. of Cardiganshire in S. Wales. It stands on the r. b. of the R. Teifi, about 5 m. inland from St. George's Channel. It contains the ruins of a castle supposed to have been built in the twelfth century. Pop. 3200. C. Bay is a wide inlet of St. George's Channel stretching from Braich-y-Pwll in the N. to Strumble Head in the S. It washes the shores of five Welsh cos., among them being Cardiganshire.

though the Teifi is the only one of any real importance, and this does not belong exclusively to the co. The chief tns. are Cardigan (the co. tn.), Aberystwyth, and Aberayron—on the coast—and Tregaron and Lampeter in the valley of the Teifi. C. is a great agric. co., producing barley and oats, while its chief industry is the rearing of livestock. Gloves and flannels are among its chief manufs.; there are also lead, copper, and zinc mines. There are, scattered over the co., traces of early Brit. camps, and also of Rom. roads and military stations, besides inscribed stones. The ruins of Strata Florida Abbey, to the S.E. of Aberystwyth, are also of interest. Most of the old customs of the co. have died out, though that of bidding, or sending for presents for betrothed people, still survives in some parts. C. sends one member to Parliament. Pop. 58,000.

Cardinal (principal, from Lat. *cardo*, hinge) title of the highest dignity, next

to the pope, of the Church of Rome. The word is still used adjectivally, meaning pre-eminent. Originally of more general application, the title was later reserved especially for members of the Sacred College at Rome (1568, by Pius V.). The pope is not obliged to consult them, but usually does, and they form his council or senate. They are all appointed by the pope alone. As early as the fourth century priests permanently ruling par. churches in Rome were called C. priests. There were also C. deacons, who administered the charities of a particular region of the city, and C. bishops in charge of the suburban sees of Rome (Porto and Santa Rufina, Sabina, Albano, Frascati (Tusculum), Palestrina, Ostia, and Velletri). Hence the title was always given to one on whom eccles. affairs 'hinged,' but the three bodies did not form the one Sacred College till the twelfth century. The Cs. are the chief members of the twenty-one sacred congregations (standing eccles. committees) of the papal gov., such as holy office, rites, index, studies, propagation of the Faith. They meet in consistory, usually with the pope as president. They are most prominent on the pope's death, as they elect his successor, usually one of their own number, this being a special duty of the Sacred College. Pope Sixtus V. in 1586 fixed the number of Cs. at seventy (six bishops, fifty priests, fourteen deacons). The numbers always varied greatly before, and may still do so, but the number of C. bishops remains six. The majority are of It. birth and live in Rome, except the priests. Those of foreign birth are known as protectors. The first C. bishop (of Ostia) is dean of the Sacred College, and has the right of consecrating the pope, if he be not already a bishop at the time. The first C. deacon may proclaim and crown the new pope. The 'Camerlengo,' who rules the Church during a papal vacancy, is a C. (Cs. have the title 'Most Eminent Prince' (Eminentissimo Signore). Among Eng.-speaking Cs. are the archbishops of Sydney (New S. Wales), Baltimore (U.S.A.), Westminster (London), and Armagh (N. Ireland). Cs. enjoy an income out of the papal treasury. They are often sent as papal representatives on delicate missions, as *legati a latere*. They wear a distinctive scarlet dress and red cap (biretta), given them by the pope. A red hat is also given them in a public consistory, but they do not wear it, and they receive the C.'s ring from the pope.

Cardinal-bird, or Redbird, species of *Cardinalis* of the passeriform Fringillidae, or finch family. The birds are very sweet singers which inhabit N. and S. America, and are often kept in captivity. The general colour of the male is red with a bright red crest and black forehead and throat.

Cardinal Points, see COMPASS, MARINER'S.

Cardinal Virtues, recognised by the ancients to be Justice, Prudence, Temperance and Fortitude and so named because all other forms of virtue were

regarded as hinging or turning upon them (Lat. *cardo*, a hinge). Such classification can be traced back to the time of Socrates. In the Catholic Church these virtues were classified as moral virtues in contradistinction to the theological virtues, Faith, Hope, and Charity.

Carding, process for combing the fibres of wool, cotton, etc. This is done to remove all impurities, and to separate the imperfect from the perfect fibres, and so prepare the latter for spinning.

Cardington, vil. of Bedfordshire, England, 3 in. from Bedford by rail, with aircraft works.

Carditis, inflammation of the heart. The term is now used as a synonym for *endocarditis*, or inflammation of the endocardium—the serous membrane lining the interior of the heart. The most frequent causes of the acute form of the disease are rheumatism and the infectious fevers; chronic *endocarditis* is usually associated with general arteriosclerosis. *Pericarditis* is inflammation of the pericardium, the membranous sac enveloping the heart. The causes are rheumatism, Bright's disease, and extension of inflammation from neighbouring parts.

Cardona, tn. of Spain, in the prov. of Barcelona, and 45 m. N.W. by N. of that place. In the vicinity, to the S.W. of the tn., is a hill composed of rock salt, some 500 ft. high, and 3 m. in circumference. It is worked like a mine. Pop. 4000.

Cardoon (*Cynara Cardunculus*), plant belonging to the Compositæ, closely related to *C. Scolymus*, the artichoke. The C. is edible, but it is the thick fleshy stalks and the ribs of the leaves which are eaten; they are cultivated and used much after the manner of celery, and come into season by the middle of Nov. Originally a native of Spain, it now flourishes in the Pampas, having been introduced into S. America for cultivation.

Cardozo, Benjamin Nathan (1870-1938), Amer. jurist, b. in New York, May 24, of Jewish parentage; educated at Columbia Univ. He was admitted to the New York Bar, 1891, and elected justice of the Supreme Court of New York for term 1914-28. In 1927 he was made chief justice of the Court of Appeals of New York State. On the resignation of O. W. Holmes in 1931, C. was recommended by all the leading Bar associations as his successor, and on Feb. 15, 1932, he was appointed associate justice of the Supreme Court of the U.S.A. In many of his judgments he strongly supported President Roosevelt's policy of the New Deal. He was noted for his learning in the philosophy of the law as well as in its application. His publications include *The Nature of the Judicial Process* (1921), *The Growth of the Law* (1924), and *Law and Literature and other Essays* (1931).

Cardross, par. and vil. of Scotland in the co. of Dumbarton, situated on the frith of Clyde, 24 m. N.W. of Dumbarton. Robert Bruce d. in C. Castle in 1329. Tobias Smollett, the novelist (1721-71),

was b. at Dalquhurn House, and a monument, 60 ft. high, which bears an inscription in Lat., written by Prof. George Stewart and John Ramsay and corrected by Dr. Johnson, commemorates the fact. Pop. 11,600.

Cards, Playing. The origin of P. C. is uncertain. It was long held that they were invented to amuse France's insane king, Charles VI. A reference is found in the registers of the *Chambre des Comptes* in 1392 to an item 'for painting three packs of cards in gold and different colours,' but no mention is made of invention. It has been asserted that they were introduced into Spain by the Arabs, who used them originally for purposes of divination, but this theory is too ill supported to receive credence. Leaving undecided the question of how C. reached Europe, it appears equally hard to discover in which European country they first made their appearance. They were known in Belgium in 1369, while a Swiss monk, Johannes, in a MS. dated 1377, now in the Brit. Museum, states that the game of C. came to Switzerland that very year. It is usually held, however, that they were originally used in Italy, while Dr. Willshire (*Catalogue of Playing Cards in the British Museum*, 1876) attributes to Venice the right of parentage. The Venetian pack at the beginning of the fifteenth century consisted of seventy-eight C., fifty-six numerals and twenty-two emblematic C. The numerals were of four suits, each consisting of four court C., king, queen, chevalier, and valet, and ten C. numbered from one upwards. The emblematic C. appear to have survived from still older times, when they were used for divination, and were subsequently combined with the numeral C. Such a pack was called a pack of tarots, probably from being *taroté*, or marked with diagonal crossings on the back. The emblematic C. were of higher value than the others, and were called *atutti*, *alouts*, or trumps. These emblematic C., however, soon disappeared from use, and the pack was reduced to fifty-two by the suppression of one of the court C. While there have always been four suits of the numbered C., there has been considerable variation of the signs employed. The earliest signs, cups, money, clubs, and swords, are still found in the ordinary It. and Sp. packs. The Gers. at first used hearts, bells, leaves, and acorns. In the fifteenth century the Fr. adopted the present signs, spades, hearts, clubs, and diamonds. The spade is the Ger. sign of the leaf, with the name *spada* of the corresponding It. suit of swords. The club is an imitation of the Ger. acorn, with the trans. It. name. The Ger. heart has survived without change, while the bell has become altered to the diamond, originally of circular shape, but now square. C. have been subject to excise duty in England since the reign of James I., when the duty was 5s. per gross of packs. It has varied greatly from time to time, and in 1801 was 2s. 6d. per pack, but was gradually reduced until in 1862 it became

3d. per pack. There is now an excise licence to sell of £1. The present import duty is 3s. 9d. a dozen packs. The number of packs made is estimated at 20,000,000 per annum. See W. A. Chatto, *Facts and Speculations on the Origin and History of Playing Cards*, 1848; W. H. Willshire, *Descriptive Catalogue of Playing and other Cards in the British Museum*, 1876; E. S. Taylor, *History of Playing Cards*, 1865; H. T. Morley, *Old and Curious Playing Cards*, 1931; W. G. Benham, *Playing Cards*, 1931. Also separate articles on the various games.

Carducci, Bartolomeo (1560-1608), It. painter, better known by the Sp. form of his name, Carducho. A pupil of Zuccaro, he helped him to paint the great cupola at Florence, and went with him to Spain, 1585. There he became painter to Philip II. and III. With Tibaldi he painted much in the Escorial. He also began frescoes in the Pardo, finished by his brother, Vincenzo (q.v.). His best work was 'The Descent from the Cross,' in San Felipe el Real at Madrid. Other works were the 'Immaculate Conception' and 'Nativity,' for the Jesuit church; 'St. Sebastian,' 'The Last Supper.' An architect and sculptor he studied under Ammanati.

Carducci, Giosué (1836-1907), It. poet, b. at Val di Castello in Tuscany. He was the son of a physician, and began life as a teacher. He spent a youth of severe study, and was appointed in 1860 to a professorship of It. literature at the univ. of Bologna. This post he held until his death, with the exception of a short interval in 1867, when he was suspended for participation in the movement for the unification of Italy. In 1876, having become a supporter of the Savoy dynasty, he was made member of the It. parliament. His poetry bears the impress of his erudition, and is frequently pedantic and recondite. His earliest verses, afterwards pub. as *Juventutia*, have little merit, and are modelled upon Alfieri and Manzoni. His best poems were written during the period 1860-70 following upon his appointment at Bologna, and were pub. under the title of *Decennalia*. They deal mostly with the political events of the time and include his famous poem, the *Hymn to Satan* (1863), which eulogises the spirit of revolt and resurgence against effete custom and worn-out institutions. The *Decennalia* show a liberation from the earlier influences, which become more complete after 1870, when C. adopted Hugo as his model and gave freer expression to his political views. His most esteemed poems are the unrhymed *Odi Barbare* (1877, 1882, and 1889), which, written in metres taken from Horace, place him, by their eloquence, dignity, and impressiveness, high in the ranks of classical writers. Though in form a classicist, C. has been placed by some among the It. 'naturalist' poets, on account of his revolutionary tendencies. His complete works were issued in *Opere* (21 vols.), 1889-1928, and *Poesie*, printed separately, 1902. See life by B. Croce, 1927.

Carducci, Vincenzo (1568 - 1638), painter, brother of Bartolomeo (*q.v.*), under whom and Zuccaro he studied. He went with his brother to Spain, 1585, and after his death finished the gallery of the Pardo for Philip III., adopting the hist. of Achilles instead of Charles V.'s life. He painted some fifty large pictures for the Carthusians of El Pualar; representing scenes from the life of St. Bruno, and martyrdoms and miracles of the monks of that order. Other works were 'Battles of the Thirty Years War,' 'St. Anthony of Padua,' 'St. Jerome' (unfinished). He wrote, in Castilian, *Dialogos de las excelencias de la Pintura* (1633).

Carduchi, race of people who formerly inhabited the mountainous dists. of modern Kurdistan and are probable ancestors of the Kurds.

Carducho, Bartolomeo, *see* CARDUCCI.

Carduus, *see* THISTLE.

Cardwell, co. and *tn.* of Queensland, Australia. The *tn.* is situated on Rockingham Bay, 800 m. N.W. by N. of Brisbane. The harbour is capacious and easy of access. Gold and tin are found in the dist., and there are extensive forests from which cedar is exported. There are saw- and tin-works and works for tanning meat. Dugong fishing is carried on. Pop. 5000.

Cardwell, Edward (1787-1861), Eng. historian, *b.* at Blackburn in Lancashire. He was Camden prof. of anct. hist. (1826-1861), rector of Stoke Bruern in Northamptonshire (1828), and principal of St. Alban's Hall, Oxford (1831). His publications include an ed. of Aristotle's *Ethics*; a students' ed. of the Gk. Testament (1837); *Documentary Annals of the Reformed Church of England from 1546 to 1716* (1839); *History of Conferences, etc., connected with the Revision of the Book of Common Prayer* (1840); *Reformatio Legum Ecclesiasticarum* (1850).

Cardwell, Edward Cardwell, first Viscount (1813-86), Eng. statesman, *b.* at Liverpool; educated at Winchester and Oxford. He became a barrister in 1838 and M.P. for Clitheroe in 1842. Sir Robert Peel made him secretary of the Treasury (1845-46). In 1847 he was returned for Liverpool, but lost his seat in 1852 owing to supporting the repeal of the navigation laws, and was in the same year returned for Oxford city. In Lord Aberdeen's ministry he was president of the Board of Trade (1852-55), and under Lord Palmerston became secretary for Ireland (1859-61), Chancellor of the Duchy of Lancaster (1861), and while secretary for the colonies (1864-66), put an end to transportation. In Gladstone's ministry he was secretary for war (1868-1874), and he carried out in 1871-72 his great plan of reorganisation, abolishing the purchase of commissions, introducing the retirement of officers, the short-service system, and, above all, infantry organisation of linked battalions (*see also* ARMY). — *General Sketch of the History of the British Army*; HALDANE. He was, in company with Lord Stanhope, Peel's literary executor, and ed. his memoirs (1860-57). Raised to the peerage in 1874

as Viscount C. of Ellerbeck. *See* Sir R. Biddulph, *Lord Cardwell at the War Office*, 1904.

Care, or Carle Sunday, the Sunday preceding Palm Sunday, so called from the practice of eating carlings, i.e. peas roasted or fried in butter, on this day.

Carême, *see* QUADRAGESIMA.

Carême, Marie Antoine (1784-1833), Fr. chef, *b.* in Paris, who became cook to Talleyrand, the Fr. plenipotentiary. He accompanied his employer to the congress of Vienna. Subsequently he became chef to the Eng. prince regent (afterwards George IV.) and to the empresses of Russia and Austria. He was famed for the artistic nature of his dishes. He wrote *Les Dîneurs de l'Empereur Napoléon*; *La Cuisine française*; *Le Maître d'hôtel français*; and other culinary works.

Carentan, *tn.* of France, in the dept. of Manche, 25 m. W. of Bayeux. It has the ruins of an anct. castle. Pop. 3600.

Carew, George, Earl of Totnes and Baron Carew of Clapton (1537-1629), Eng. nobleman. He studied at Oxford, and afterwards held a command in the Irish wars against the earl of Desmond. In 1596 he led a successful expedition to Cadiz, and was afterwards appointed lord president of Munster, where he soon reduced the rebels to submission. He is often supposed to have written an account of the Irish war in the work *Hibernia Pacata*. But the virtual author of this book was Sir Thomas Stafford, reputed to be C.'s natural son, who had served with him in Munster. C. is also said to have written the hist. of the reign of Henry V. which is embodied in Speed's *Chronicle*. C. certainly preserved and annotated all letters and papers relating to Ireland of his own day, and many vols. of his MSS. on Irish affairs were placed by Laud in the Lambeth Library; while others are among the Harleian MSS. He lived on the closest terms of friendship with Sir Walter Raleigh for thirty years, and in 1618 pleaded with James I. on behalf of Raleigh, while Lady C. proved a kind friend to Raleigh's family after the execution.

Carew, John Edward (1785-1868), Irish sculptor, *b.* at Waterford, but came to London in 1809, where he d. He exhibited at the Royal Academy from 1830 to 1848. His best statues are 'Whittington listening to the London Bells,' 'The Death of Nelson at Trafalgar,' and 'The Model of a Gladiator.'

Carew, Sir Nicholas, Eng. courtier and favourite of Henry VIII., related to Anne Boleyn. He attended Henry in France, 1513, and was knighted before 1517, when he became keeper of Greenwich Park. He became Master of the Horse, 1522; envoy to France, 1527 and 1532. C. was M.P. for Surrey, 1529, and envoy to Charles V., 1529-30. He was executed for his share in the marquess of Exeter's conspiracy, 1539.

Carew, Sir Peter (1514-75), Eng. soldier, travelled largely in France and Italy. He served Philip of Orange, 1525-30. Henry VIII. made him a gentleman of the privy chamber. C. served in the Fr. war,

1544; was knighted, 1545; sheriff of Devonshire, 1546. He helped to crush the Devonshire rising, 1549. He opposed Mary's marriage with Philip, was imprisoned for a time, but became constable of the Tower, 1572. See life by Hooker (Vowell); *Catalogue of Carew MSS.*, 1515-74.

Carew, Richard (1555-1620), Eng. poet and antiquary. He studied at Christ Church, Oxford, and was sheriff of Cornwall. His *Survey of Cornwall* (1602) was held in high repute and was reprinted in de Maiseaux's ed. (1723 and 1769), and in Tonkin's (or Lord de Dunsterville's) (1811). His trans. of the first five cantos of Tasso's *Gerusalemme Liberata* (1594) is more correct than that of Edward Fairfax.

Carew, Thomas (c. 1598-1639). Eng. poet and courtier; educated at Oxford, afterwards leading a somewhat wandering life. For a time he travelled as secretary with his kinsman, Sir Dudley Carleton. He went on embassies to Venice, Turin, and to France (1619), and was later attached to the court of Charles I. C. wrote *Calum Britannicum*, a masque (1634), short poems, and sonnet addressed to a 'Celia.' His poems show Donne's influence. He formed one of the poetic circle that surrounded Ben Jonson, and was a friend of Sir John Suckling. His collected works were ed. by Arthur Vincent, 1890.

Carex (Lat. *carex*, sedge), genus of plants of the order Cyperaceae. The various species are for the most part inhab. of wet and swampy grounds, in bogs, fens, and marshes, in the temperate and N. parts of the world; in Britain they are known as sedges. The flowers are unisexual, sometimes dioecious, and are devoid of perianth-leaves. The male flower consists of a simple spike, the three stamens being situated in the axils of glumes; the female flower consists of two or three superior, united carpels. The leaves are stiff, with sharp or saw-like edges, and vegetative reproduction by offshoots is common. The tough, hard leaves are used in hop-grounds for tying the hops to poles, in Italy they are placed between staves of wine-casks and used for making cask-bottoms. In *C. sylvestris* they are combed and dressed and used for lining gloves and shoes in Lapland as a protection against frostbite. *C. arenaria* frequents sand-dunes; *C. dioica* and *C. scirpoidea* are dioecious specimens. Cotton 'grass' (*Eriophorum*), growing on moors, is also a member of the Cyperaceae.

Carey, Henry (c. 1690-1743), Eng. humorous poet and musician, reputed son of George Savile, marquess of Halifax. He studied music under Rosenkrantz and Gemlinian. C. was author of the libretto to *The Dragon of Wantley* (music by Lampe, 1737); he pub. six cantatas (1732), and *The Musical Century* (1737). His famous *Chronotholothologos* (1731) is a burlesque on the mouthing plays of his period. His *Poems on Several Occasions* (1729) were praised by Addison. His name is best remembered for the ballad *Sally in our Alley*, but the present tune is

not C.'s. C. was said to be author and composer of *God save the King*, but the claim was unfounded. His poem *Namby Pamby*, in ridicule of Ambrose Philips (q.v.), added expression to the language. His granddaughter was mother of Kean, the tragedian.

Carey, James (1845-83), Irish revolutionary, b. in Dublin. He became a member of the Fenian conspiracy and one of the originators of the Invincibles (1881). He took part in the murder of Lord Frederick Cavendish and Mr. Thomas Burke, permanent under-secretary for Ireland, on May 6, 1882, but tried to save himself by turning queen's evidence. He was, however, murdered soon afterwards on board ship, near the Cape, by Patrick O'Donnell.

Carey, Lucius, see FALKLAND, VISCOUNT.

Carey, Sir Robert (c. 1560-1639), youngest son of Lord Hunsdon, served Queen Elizabeth in various capacities, finally becoming Eng. warden of the Border Marches. He carried the news of her death to Edinburgh in the short space of sixty hours. He was created earl of Monmouth by Charles I. in 1626, but the title d. with him. His *Memoirs* (ed. 1808) contain an interesting record of Border hist.

Carey, William (1761-1834), Eng. oriental scholar, b. at Paulerspury in Northamptonshire. In 1787 he became minister first at Moulton in Northamptonshire, and afterwards at Leicester. Active in forming a Baptist missionary society, he was chosen in 1793 first Baptist missionary to India. He laboured ardently to spread Christianity and issued Bibles in forty different oriental languages and dialects. He also pub. grammars and dictionaries in Bengali, Mahattal, and Sanskrit, and ed. the *Rāmāyana* (1806-1810). He was from 1801 to 1830 oriental prof. at Fort William College, Calcutta. See his life (1835) by George Smith (Everyman's Library).

Carlin, vil. in par. of Bothwell, Lanarkshire, Scotland, notable for a grotto laid out on similar lines to that of Lourdes. Many Catholic pilgrims visit it annually. There are also collieries. Pop. 2000.

Cargados, or Nazareth Islands, group of 18, lying N.E. of Mauritius, of which they are a dependency.

Cargill, Donald (1619-81), Scottish Covenanter, b. at Rattray, Perthshire. He was made minister of Glasgow in 1655, but deprived of his living for opposing the Restoration (1660). He fought at Bothwell Bridge (1679), became a field preacher, and took part in the Sanquhar declaration (1680). Soon afterwards he excommunicated the king and his officials at Torwood, near Stirling, for which act a reward was offered for his capture. Executed at Edinburgh, July 17, 1681.

Cargo, see under BILL OF LADING, and FREIGHT.

Carham, par. in the co. of Northumberland, England. It is situated on the R. Tweed and has a railway station. Pop. 900.

Caria, anct. maritime prov. of Asia

Minor, bounded by Ionia and Lydia on the N., the Aegean Sea on the S., and Lydia on the E. The country is mountainous, its chief heights being over 3000 ft., while Mt. Latmus reaches the elevation of 4500 ft. The coast is irregular and deeply indented, being fringed with numerous is., chief among which are the Gk. is. of Rhodes and Cos. The Carians were originally a distinct nationality and maintained themselves in the interior against the Gks., but were afterwards subdued by the Persians. The country was conquered by Alexander the Great, and became finally part of the Rom. Empire. It now forms part of Turkey.

Cariama, *Dicholophus*, or *Seriema*, genus of S. Amer. birds, resembles the secretary bird, and is often placed near it among the Falconiformes. Internally, however, it is nearer to the Gruiformes, and the family *Cariamidae* is now usually classed under that tribe. *C. cristata*, the seriema or crested screamer, is a common species with long legs, short wings, short and slightly hooked beak, a well-developed crest, and long tail. Easily domesticated and will guard its owner's fowls when tamed.

Cariban, see **CARIBS**.

Caribbean Sea, part of the Atlantic Ocean that lies between the coasts of S. and Central America and the is. of Cuba, Haiti, and Puerto Rico and the Leeward and Windward Is. It communicates with the gulf of Mexico by the Yucatan Strait, and is divided into two deep basins, both in parts over 20,000 ft. deep, by a broad submarine bank less than 6000 ft. deep, lying between Jamaica and Honduras. The E. and larger basin has an area of 231,000 sq. m. The W. basin is considerably smaller. The two basins are united by a strait between Jamaica and Cuba and Haiti. The sea forms the turning point of the Gulf Stream. See G. H. Blakeslee (ed.), *Mexico and the Caribbean*, 1920; A. Waugh, *The Sunlit Caribbean*, 1948.

Caribbee Islands, name, chiefly of historical importance, sometimes applied to the whole of the W. Indies, strictly comprising only the chain of is. from Puerto Rico to the Venezuelan coast of S. America. They are known also as Lesser Antilles, the bulk falling into the two groups of Leeward and Windward Is. Some of the chief is. in the chain are St. Christopher (St. Kitts), Nevis, Montserrat, Dominica, St. Lucia, St. Vincent (Brit.); Guadeloupe, Martinique (Fr.); Saba and St. Eustatius (Dutch).

Cariboo, dist. of Brit. Columbia extending on both banks of the Fraser R., near its source. It is important on account of its gold mines.

Caribou, see **REINDEER**.

Caribs, or **Caribbees** (Charaibeos), name (first used by Columbus) of a predatory, warlike people of S. America, from whom the Cariban stock takes its name. They were expert seamen and, according to the latest views, spread from S. America northwards, occupying the Lesser Antilles, near what is still called the Caribbean Sea, by conquest of the original Arawakan

tribes. They were distinguished for ferocity and cruelty, and made a bold resistance to the Spaniards. C. is said to mean valiant man. They were cannibals, the word cannibal itself being a corruption of Columbus's 'caribal' (derived from their tribal name), perhaps referring to the 'canine' voracity of the C. See **CANNIBALISM**. To put an end to the constant disturbances caused by the C., the Eng. gov. in 1796 deported them nearly all from Dominica and St. Vincent to Ruatan Is. off Honduras. They numbered about 5000, and have since spread over the neighbouring mainland, the majority being now settled in Honduras and Nicaragua. Among the chief Cariban tribes are the Palenques in Brazil; Bakairis and Nahuquas on the Upper Xingu; Apotos and Waywal in Brazilian Guiana; Roncouyennes and Galibis in Fr. Guiana; Mucusi in Brit. Guiana; Kalinas in Dutch Guiana; Makirifares and Motilones in Venezuela. They are usually slight in figure, but strong and well-formed, though lacking muscle. They were described at the discovery of the new world as 'the strongest, handsomest, and most intelligent' natives of that part. They are reddish-brown in colour, with long, thick, black hair, and Mongoloid features. They drink quantities of *patiwari* (liquor made from the cassava plant). Through admixture with negroes some are known as Black C. The C. were partly an agric. people, and made good pottery. The modern tribes are far more peaceful than the anc. They no longer have communal dwellings, but separate families, each in its own house. Their religion is ceremonial, and they practise the *couvade* (*q.v.*). The favourite weapon is a battle-axe of polished stone. The kinship of the various C. communities from Central America to Central Brazil is entirely linguistic. See also **AMERICAN INDIANS**.

Carica, typical genus of the order **Caricaceae**, which grows in tropical America. The best-known species is *C. Papaya*, the papaw, a tree which has many uses. It is eaten ripe, boiled as a vegetable, the milky juice is a vernifuge. The juice of the plant forms a cosmetic, the leaves are used in washing instead of soap, and animals fed on the plant become tender. *C. candamarcensis* has edible seeds.

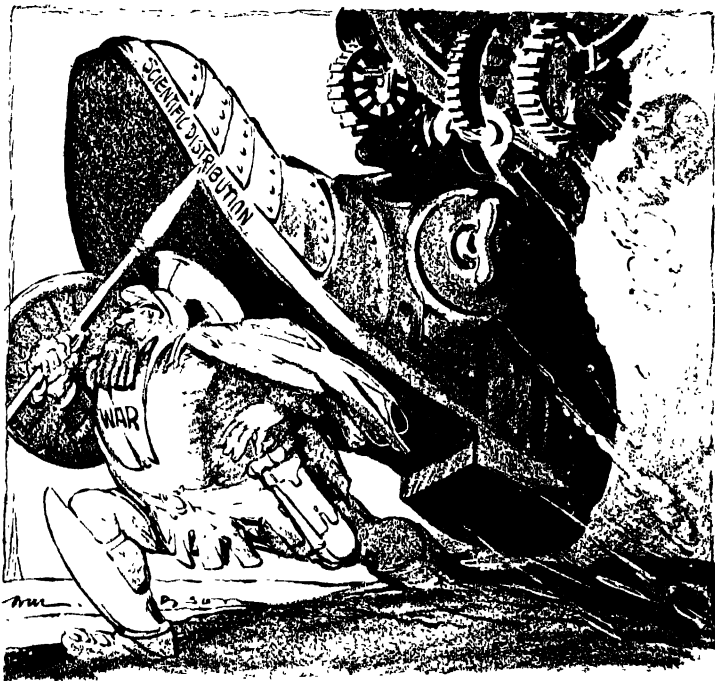
Caricature (It. *caricatura*), a representation of some person or group in such a manner as to excite ridicule or contempt. The word is from the Low Lat. *Caricare*, to load a car, and its connotation is 'to charge or load with exaggeration,' and the It. word *caricatura* was first given its present meaning by Annibale Carracci as applied to drawings in this vein by himself and others of his school in Bologna in the sixteenth century. In Eng. the word is comparatively modern, having been first used by Sir Thomas Browne in his *Christian Morals* (part iii.), but the hist. of C. goes back certainly to Gk., possibly early Egyptian times. In Greece and Rome, however, pictorial as compared with literary satire held but a small place. With the exception of a few vase paintings which have survived, Gk. Cs. are only

known to us through references in Aristophanes and elsewhere, but many grotesque drawings have been uncovered in Pompeii and Herculaneum, and Pliny mentions painters skilled in burlesque portraiture. Both literary and artistic C. have always based themselves more or less on actual facts and features. Even physical deformity, which ought to excite pity, has often been made a subject for derision, and as religious wars have been among the most cruel, so religious Cs., as in the pagan mockeries of the early Christians, and the broadsheets issued during the Reformation, have been among the most venomous and insulting. Artists in the Middle Ages loved the grotesque; witness the monsters of the illuminated MSS. and the gargoyles of the cathedrals. In the tenth and eleventh centuries the story of Reynard the Fox, among others, was used by monkish writers for satirical and didactic purposes; after passing through many variations, the story as now generally known was printed at Lubeck in 1498, with illustrations to match the text. Caxton had already pub. an earlier version in Eng. A generation later Holbein produced his 'Moralities,' including the famous 'Dance of Death.' These prepared the way for the great development of the art of C. in the sixteenth and following centuries. Germany and Holland were at first most prolific, but Jacques Callot of Lorraine (1592-1635) struck out a new line, which was freely copied. As pictorial satire had played so great a part in religious disputes, it was now employed also in politics. Political C., unknown in the conditions of society in the Middle Ages, was only introduced with the art of printing. One of the earliest engravings which can be called a political C. was a Fr. drawing of 1499 entitled *Le Revers du jeu des Suisses* ('the defeat of the game of the Swiss'). The picture shows a card table round which are Louis XII. of France, Henry VII. of England, the king of Spain, and a Swiss noble, the lesson being that Louis has won the game, viz. his aspirations to it. ter., despite the open hostility of the Swiss nobles. The majority of such Cs. as were produced in this early period were Fr. Cs. in France became comparatively frequent in the seventeenth century, but ceased with the curtailment of the freedom of the press under Louis XIV., though many were pub. in Holland or other countries and imported, Louis XIV. being the especial object of satire. In England political C. was unknown up to the sixteenth century, and only came into some vogue with the political struggles of the Stuart period. The earliest victims of such satire were the Episcopalian party in the Church and the cavaliers, whose insolence supplied the caricaturist with his cue. A famous Eng. C. of this period was one entitled 'An Embleme of the Times,' produced in 1647; it represents war as an armed giant trampling on mutilated bodies, while Hypocrisy, a two-faced woman, is seen fleeing towards some distant city. Playing-cards were not seldom the medium for C., directed against the Commonwealth, Gen.

Lambert being a favourite subject, the inspiring force behind these Cs. being the Court party, who were the equals of the reformer in appreciating the power of C. on popular imagination. In 1710 there was a veritable storm of Cs. in England, provoked by hatred of Dr. Sacheverell; while in the same period the Whigs began to make full use of the weapon. Many if not most of these Cs. were actually produced in Holland, to which country modern political C., though originating in France, owes its development. With the accession of George I. (1714) the public appetite for political and social C. increased greatly, and became almost a necessity of social life; but it was rather in the time of Walpole that Eng. political C. received its great impetus, when both Whig and Tory made use of it. Women of the period took so great an interest in politics that Cs. of that time were often introduced on fans and on other articles of a personal nature. Yet even then the popular idea of a C. was indeterminate. Cs. were called 'hieroglyphics,' because they were so full of mysterious allusion and not comprehensible to the ordinary mind. During the eighteenth century C. in England reached its height in the works of Hogarth, whose 'Marriage à la Mode' and similar Cs. have never been excelled. In politics, the S. Sea Bubble and the abuses of Walpole's administration invited and received satire, and with the outbreak of the Fr. Revolution came also a furious cartoonists' war, Gillray and Rowlandson being matched against Fr. rivals of equal virulence if less power. Gillray, whose first Cs. were directed against the Shelburne Ministry and developed with malicious pungency against George III. (as e.g. in the famous C. of 'The King and the Apple Dumpling') was the greatest caricaturist of his age, and his works form a hist. of the more important part of the reign of George III. Champlurey's *Histoire de la Caricature*, gives an idea of the savage, often disgusting, work of that era in France. During the nineteenth century these grossnesses were quite abolished in England and largely so abroad. A great impetus to Fr., and indeed to European, C. was given by the Fr. periodical, *La Caricature*, founded by Charles Philippon (1806-62) in 1830, followed two years later by *Le Charivari*. In these and in *Le Journal de Paris*, which was started in 1847, Philippon encouraged a distinguished body of Fr. caricaturists, which included such celebrated names as Honoré Daumier, Paul Gavarni, H. T. Mounier, 'Grandville' (Jean Gérard), and Gustave Doré. Following the Fr. example, *Punch*, or the *London Charivari* was founded in England in 1842, and similar periodicals were produced in Germany, Italy, and in most, if not all, European countries, each country developing its own style of C. with strongly marked national characteristics. Among Ger. caricaturists T. H. Heine with his bitter satire deserves particular mention, and in France 'Caran d'Ache' (Emmanuel Poiré) and 'Cham' (Vicomte de Noé), with many others carried on the brilliance

of their predecessors. To return to Great Britain, George Cruikshank comes between the school of Gillray and the later one of *Punch* with a style all his own. With his brother Robert, he began as a bitter political caricaturist, but is chiefly remembered for his later drawings depicting the social life of his time. Since his time Great Britain has been exceedingly rich both in caricaturists proper and in draughtsmen whose work is sometimes

Among other political cartoonists of the time mention must be made of W. Bowcher in the periodical *Judy* and Gordon Thomson in *Fun*. The introduction of photo-process-engraving in the early seventies freed artists from their hitherto dependence on wood-cut technique, and was thus an important encouragement to C. of a wider range and versatility. The charming sketches of Randolph Caldecott (1846-86), the fun and pathos of Phil May,



THE NEW DUTY OF SCIENCE

A *Daily Herald* cartoon (1933) by Will Dyson, reproduced with permission.

difficult to classify (e.g. the famous cartoon 'Dropping the Pilot' by John Tenniel). John Leech (1817-64) with his political cartoons (this word being first applied by him to a C. drawing), Richard Doyle (1824-83), Sir John Tenniel (1850-1900), C. S. Keene (1851-1891), Du Maurier (1860-96), Linley Sambourne (1871-1910), Harry Furniss (1880-1925), E. T. Reed (1890-1920), Sir Bernard Partridge (1901-1925), and others gave much of their best work in *Punch*, either in political C. or in illustration of jokes. Cs. of prominent people gained an especial vogue in the pages of *Vanity Fair* with the work of 'Ape' (Carlo Pellegrini) and 'Spy' (Leslie Ward),

and the brilliant work of artists such as 'F. C. G.' (Sir Francis Carruthers Gould), Max Beerbohm, and others, have helped to place Eng. humorous art in the very first rank. Gould was the first cartoonist to draw daily for a newspaper, the *Westminster Gazette*, and Max Beerbohm's wit found expression in his drawings of humorous situations in which he placed the leading figures of his day, mostly from the world of letters. His drawings were of the simplest in outline. Phil May, although Eng. born, began his career with his work for the *Sydney Bulletin*, a periodical in which an Amer. artist, Livingstone Hopkins, also made a name for political and social satire. Will.

Dyson also graduated from the *Sydney Bulletin* to become well known in England during the First World War and for many years after it for his hard-hitting political cartoons, reminiscent of Gillray. Australia has continued to provide a flourishing field for the caricaturist. Norman Lindsay is only one among many names. Another Australian paper, the popular *Smith's Weekly*, provides an outlet for well-executed cartoons, although somewhat gross in taste, on political topics. As mentioned above, the word C. has to-day given place to cartoon, and this latter word, which in its primary significance meant a picture of a larger size than usual in a paper or periodical, is now applied to any political or social C. of any size whatsoever. In connection with humorous illustration, which is a C. of life and often combined with the creation of characters, mention must be made of Wm. Heath Robinson with his whimsical inventions, George Belcher, and Bruce Bairnsfather, the creator of 'Ole Bill,' a prominent character of the First World War. In the thirties, however, the illustrated joke began to show a decline in popularity, and the comic situation picture with little or no explanation in words came into vogue. In this connection H. M. Bateman, 'Fougasse' (Kenneth Bird), and 'Pont' became acknowledged masters. Meanwhile, the London daily newspapers, taking their lead from the *Westminster Gazette*, made a regular feature of the cartoon. Some prominent cartoonists, e.g. 'Poy' (Percy Farrow) of the London *Evening News*, delighted in very small cartoons of no pretensions to artistic merit, with serial characters like 'John Citizen' and 'Dilly Dally,' symbolical of the gov. 'mandarin,' which became familiar through repetition. David Low, on the other hand, the Australian-born cartoonist and probably the best-known cartoonist in England of his day, indulges in bold outlines with considerable artistic merit. He possesses a keen political sense, and his satires in the London *Star* and, later, in the London *Evening Standard* on political and social life, are full of sting but sometimes coarse. In particular, his cartoons on Hitler, Goering, and other Nazi leaders before and during the Second World War were unrivalled. In a lighter vein the cartoons of Sidney Strube, the creator of the 'Little Man,' though intentionally devoid like those of 'Poy' of artistry, were always popular and apposite. W. K. Haselden of the London *Daily Mirror* became known for light social satire, and the work of the cartoonist as a sports cartoonist found its pioneer in Tom Webster. In the U.S.A. political C. for a hundred years kept pace with that of Europe, deriving from Gillray, whose influence was brought to America by Wm. Charles, a Scottish immigrant. From the time of the Civil war, political satire received a tremendous impetus in the U.S.A., achieving its greatest prominence in the work of Thomas Nast; and both in caption and draughtsmanship the cartoons of such papers as *Judge* and *Life*

were ahead of those of almost any other country. During the last forty years the work of Amer. cartoonists has given rise to the outstanding popularity of the 'comic strip,' without which a newspaper is hardly complete in the U.S.A. Comic strips portray a series of episodes in the lives of imaginary but typical cartoon characters. Harry Herschfeld, Reuben Goldberg, George McManus (of 'Bringing Up Father' fame), Rudolph Dirks (creator of the Katzenjammer Kids), Harold Gray, Bud Fisher (creator of Mutt and Jeff) are a few names among many artists who have achieved fame in the art of the comic strip, which also gained greatly in popularity in Great Britain during the Second World War.

Caries, necrosis (death) of harder tissues, i.e. bones and teeth, of the body. It resembles the ulceration of the softer tissues, but by reason of the constitution of the parts attacked, it is of a more serious nature, and the inorganic constitution of the tissues renders them less easy to replace, and therefore to heal. It is generally caused by an injury, but also accompanies scrofula, syphilis, phosphorus poisoning, and tubercle. The chief seats of the disease are the cancellated (spongy) bones, the bones of the vertebral column, and those of the fingers and feet. The diseased bone becomes soft and red, and particles come off, while the ulceration of the bone itself comes to the surface and forms a fistula. The matter of the ulceration must be removed, and the part treated antiseptically when the bone may heal, or the result may be obtained by gouging or excision. A course of calcium phosphate promotes formation of new bone. Dental C. (see DENTISTRY) is chronic decay of the teeth.

Carigara, tn. on the coast of Leyte, Philippine Is. It is a port of call for steamers coming from Manila. Pop. 16,500.

Carignan, tn. of France, in the dept. Ardennes, on the R. Chiers. Its original name was Yvois. It is a very old tn. and its industry is supplied by the iron mines. Pop. 2300.

Carignano, tn. of Italy, situated S. of Turin (Piedmont). The name of this tn. is that of a branch of the Savoy family—Savoy-Carignan. Pop. 6700.

Carijos, one of the original tribes of Brazil. When the Portuguese colonised Brazil they received them and were not hostile in any way. Later on, however, they rose when attacked, and this led to their almost total extermination.

Carillon, set of bells upon which tunes can be played. This is done by some kind of keyboard mechanism, actuated by hand or by electric power. A C. differs from chimes by the bells being fixed instead of swinging and struck on the outside by hammers. In some parts of Europe C. playing has for centuries been important. There are famous Cs. in Holland, notably at Bruges. As a war memorial the idea of installing keyboard Cs. was adopted after 1918 at Loughborough and at Wellington (New Zealand). C. music exists mostly in MS. Schott,

in 1862, pub. an important selection of preludes, fugues, and minuets from the works of Matthias van den Gheyn (1721-1785), which was ed. by van Kleywick in collaboration with the organist Lemmens. In more recent years, J. Denijn and J. A. F. Wagenaar wrote specially for the C. Elgar composed a special *Memorial Chime* for the opening ceremony of Loughborough C. in 1923. C. music must exhibit an intimate knowledge of clavier technique. Two-part writing, with clearly defined harmonic suggestion, is regarded as the most effective. A school of C. playing was inaugurated at Malines (or Mechlin) in 1922, with Denijn as director. In England a comprehensive course was adopted by Prof. Granville Bantock (q.v.) at Birmingham Univ., where a lectureship was instituted in campanology, including bell-making and tuning, acoustics of bells, Cs. and C. music and chime tunes, the composing of bell music, etc.

Carilocus, see CHARLIEU.

Carimata Islands, group of more than 100 is. situated W. of Borneo. They are separated from the is. of Billiton by the strait of the same name. The largest one of this group Grand C., is woody and mountainous. Pop. 500.

Carina, or **Keel**, term applied to two of the petals of a papilionaceous flower, e.g. pea or labr. ant., which are fused together and form a boat-shaped structure.

Carinaria, genus of gastropod mollusc, is to be found in tropical seas and the Mediterranean. The shell is shining in appearance, small and conical in shape, the foot is long and the visceral sac is small. *C. mediterranea* is a common species.

Carinatus, the larger of the two groups of living birds, the other being the *Ratitae*, e.g. emus and ostriches. It receives its name from the fact that the sternum is always keeled except in flightless forms, e.g. dodos, but nearly all the species have well-formed wings capable of flight. See BIRD.

Carini, tn. of Sicily in the prov. of Palermo. It is situated in a hilly country and has a Gothic castle. Pop. 14,300.

Carinthia (Ger. *Kärnten*), prov. of Austria, E. of Tyrol, of area about 1000 sq. m. The dist. is mountainous, bounded on the N. by the Hohe Tauern and Styrian Alps (with Gross Glockner, Hochnarr, Ankogel, Hafner Eck, Königstuhel, etc., ranging from about 8000 to 12,000 ft.); on the S. by the Carnic Alps and Karawankas (Dobratsch or Villacher Alp, Och Obir, Petzen, etc., ranging from about 7000 to 9000 ft.). The R. Drave flows through the prov. from E. to W., its valley separating the two mt. chains. There are many beautiful lakes (Wörther, Millstätter, and Weissen), and valuable mineral springs. Among the many passes across the mts. are the Pontebba or Pontafel Pass, through which goes one of the chief Alpine roads from Italy to Austria (the fortress of Malborgeth near by, overwhelmed by Fr., 1809); the Predil, through which goes the main road from C. to the coastland (with Predil fort

near by, also stormed by the Fr., 1809), the Loibl, Seeburg, and Arlscharte. Klagenfurt is the cap. and centre of the railway lines. Only a small part of the prov. is adapted for tillage, most of the productive land having forests. Rye, wheat, oats, buckwheat, and clover-hay are the chief crops. Valuable horses and livestock are reared. The mineral resources are very great. C. is one of the chief lead producers for Europe. Iron, coal, and zinc are also found. Bessemer steel rails, wire, bar-iron, and wire nails are manufactured. Machinery, textiles, wood-pulp, leather goods, firearms, and cement are exported. Under the Austrian Constitution of 1920, C., like the other provs., sent its quota of members to the Bundesrat in proportion to its pop. (this is approximately 5.67 per cent of the total pop.). About 70 per cent of the people are Gers., 30 per cent Slovenes or Slavs. The majority are Rom. Catholics. Many tns. in C. are becoming popular resorts. C. was part of Noricum under the Rom. Empire. The Carni were overwhelmed by Slavs (c. sixth century); Charlemagne annexed it to the Frankish Empire; then for 500 years it was ruled by various dukes, finally coming under archdukes of Austria, 1335. Since then, except when held by the Fr., 1809-13, it was directly subject to Austria. A small part of C. was transferred to Italy in 1920 and another to Yugoslavia. Pop. 405,000. See A. Horner, *Kärnten*, 1930.

Carinus, Marcus Aurelius, Rom. emperor c. A.D. 283-85, son of Carus, and governor of W. Empire under him. He fought against Ger. tribes, then returned to Rome and luxury. On the death of C.'s brother, Numerianus, Diocletian was proclaimed emperor in Mesia. C. won a battle against Diocletian on the Margids, but was afterwards killed by his own soldiers. See Vopiscus, *Carinus*.

Caripuna, tribe of savages occupying parts of S. America. They are found in Brazil, on the banks of the Madeira R.

Carisbrooke, par. in the Isle of Wight in the co. of Hampshire, England. It lies to the S.W. of Newport, and was once the cap. of the is. C. Castle, partly in ruins, is the distinguishing feature of the tn. It dates back to very early times, and was the scene of the imprisonment of Charles I. for a time. Pop. 5000.

Carissa, genus of thorny shrubs of the order Apocynaceae, found in Asia, Australia, and Africa. *C. Carandas*, Christ's thorn, or the carandas-tree, is used for fencing in India, and the edible fruit is pickled, preserved, or eaten raw. *C. Xylocaron*, the bitter-wood, is a native of Madagascar.

Carissimi, Giacomo (c. 1604-74), It. musician. He was chapel master at the church of Sant' Apollinare, and is famous for his reform of the recitative, and for being practically the inventor of the cantata. His music is distinguished by its pure style and its exquisite melodies, while among his followers may be numbered such men as Bassani and Alessandro Scarlatti. He wrote a number of oratorios and cantatas, the most famous

among the latter being *The Sacrifice of Jephthah*.

Carit Etlar, pen-name of the Dan. dramatist and novelist, Johan Karl Christian Brosbøll (1816-1900). He was b. at Fredericia, and studied painting for some time at the academy of Copenhagen. He then took up literature, and pub. *Slægtskabet* in 1839. His works include historical romances, tales of Dan. life, and dramas. His *Skrifter* (collected works) appeared at Copenhagen in 1859-1868, and a fresh collection was pub. from 1873 to 1879. Among individual works may be named *Livets Conflicter* (1844); *Skyggebilleder, Nordenskjold* (1879); *Arabere og Kbhvler* (1868).

Caritat, Marie Jean Antoine Nicolas, see CONDORCET, MARQUIS DE.

Carle Sunday, see CARE.

Carlén, Emilie Smith Flygare (1807-1892), Swedish novelist, b. at Strömstad, the daughter of Rutger Smith, a trader. In 1827 she married Dr. Flygare. She was left a widow after about six or seven years, and she then began her literary career, writing *Waldemar Klein* in 1835. Shortly after this she married Johan Gabriel C., a poet, and settled in Stockholm. Among her works, many of which have been trans. into Eng., are *Gustav Lindorm* (1839); *Fosterbroderne* (1840); *Rosen på Tistelåen* *Berättelse från Skargården* (1842); *Jungfruornet, Sjöroman* (1848).

Carlentini, tn. of Sicily, situated 19 m. from Syracuse. It was founded by the Emperor Charles V. Pop. 10,000.

Carli, or Carli-Rubbi, Giovanni Rinaldo, Count (1730-95), It. political economist and antiquary. Senate of Venice made him prof. of astronomy and navigation, 1744-50. President of Council of Commerce in Milan, 1753. He persuaded Joseph II. to abolish the Inquisition. His most celebrated work is *Delle monete e dell' istituzione delle zecche d' Italia*, on the coins of Italy (1754-60). Others are *L'Uomo, Libero* (1772); *Lettere Americane* (c. 1780); *Delle antichità italiane* (1788-91).

Carlile, Richard (1790-1843), Eng. reformer, b. at Ashburton, Devonshire, the son of a shoemaker. He was educated at the vil. school, and after having endured many hardships during his apprenticeship to a tinman, he became a journeyman tinman in London. After reading books on the subject, he became an extreme Radical, and underwent sev. terms of imprisonment for publishing some of these books which had been suppressed, especially those of Thomas Paine—whose effigy he had helped to burn when a boy—and also for writing his *Political Litany*, a work of the same kind. He was set free in 1825, and became editor of the *Gorgon*, a political paper. He pub. the *Moralist* (a series of moral essays), and a large number of pamphlets. C.'s activities did a great deal toward securing the freedom of the press and he certainly won the admiration and sympathy of powerful friends who took good care to keep in the background. Cobbett, and others, however, deprecated the idea of establishing the theological

or even the medical freedom of the press as mischievous. Consult G. J. Holyoake, *Life and Character of Richard Carlile*, 1849; G. A. Aldred, *Richard Carlile, Agitator*, 1923.

Carlile, Wilson (1847-1942), founder of the Church Army, b. at Brixton, Jan. 14, of Scottish descent on his father's side; educated London College of Divinity. In early life he entered business, travelled much on the Continent, and studied music. He was influenced by the Moody and Sankoy mission of 1875, and in 1880 was ordained in the Church of England. Two years later, while working in the slums of Westminster, he founded the Westminster Mission, from which the Church Army developed. A breakdown in health caused him to accept a living at Netteswell, Essex, in 1891, but a year later he became rector of St. Mary-at-Hill, London, where he remained until his retirement in 1926. His evangelistic and social work grew in value, and in 1896 the Church Army mission was carried to prisons and reformatories. In 1906 C. became prebendary of St. Paul's Cathedral, and shortly after travelled on the Continent to study labour conditions, publishing on his return *The Continental Outcast*. After the First World War, during which the Church Army did notable work, the movement spread overseas, taking root particularly in the U.S.A., which C. visited in 1926. Awarded C.H., 1926; Hon. D.D., Oxford Univ., 1915, and Toronto Univ., 1926. C. had outstanding gifts of leadership and organisation, and as founder and hon. chief secretary of the Church Army his active missionary work did not cease until his death on Sept. 26, 1942. Pub. *The Church and Conversion* (1882); *Spiritual Difficulties* (1885); *Baptism of Fire* (1907). See Sidney Dark, *Wilson Carlile*, 1944.

Carlina, genus of Compositae, spreads over Europe to the middle of Asia. C. vulgaris, the carline thistle, is a native of Britain; it has the curious habit of opening widely in dry weather, and in wet seasons the white inner leaves of the surrounding bracts cover over the flower-heads, leaving the prickly outer bracts exposed to the rain. C. acaulis, the weather thistle, is abundant in the Alps and has the same characteristic action. The purgative obtained from the roots is used in veterinary practice.

Carling, Sir John (1828-1911), Canadian statesman and capitalist, b. in London, Ontario. His father, Thomas C., was a native of Yorkshire, and left England for Canada in 1818. In 1862 he held the post of receiver-general of Canada, and later became commissioner of agriculture and public works. He was afterwards minister of agriculture, and in 1882 postmaster-general. He also founded the Agric. College in Ontario. K.C.M.G. in 1893.

Carlingford, tn. of Eire, in the co. of Louth in the prov. of Leinster. It stands on the sea-coast on the bay, or lough, of the same name, and is noted for its oyster fisheries. Pop. 600.

Carlisle Lough, part of the Irish Sea between co. Louth and co. Down. It is 10 m. long and 2 m. wide, and can accommodate the largest ships.

Carlisle, city in Macoupin co., Illinois, U.S.A. Pop. 4000.

Carlisle (Rom. *Luguvallium*, Brit. *Caer Luel*), parl., city, and co. bor., cap. of Cumberland, England, stands on a fertile tract of land about 10 m. from the Scottish border on gently rising ground surrounded on three sides by the Rrs. Eden, Caldew, and Petteril. It is on the N.W. line of communication from England to Scotland by road and also an important railway junction with many lines converging into it, attached, since the railway merger, to the great London, Midland and Scottish and the London and N.E. systems (now Brit. Railways). It is also the centre of an efficient local and long-distance bus service. The city is just S. of Hadrian's Wall from the Tyne to the Solway Firth and was once a Rom. civil settlement—the great cavalry fort of *Petrian* being half a mile distant on the N. side of the riv. During the Dan. invasions it was attacked and burnt and lay in ashes until the coming of the Normans. William Rufus realised the importance of a place lying so near to the N. frontier of his kingdom and gave orders for its re-building. He also caused a keep and walled enclosure to be erected (1092). By 1170 the castle, further enlarged and strengthened, was playing its part both in the continuous border warfare, that only ceased with the Union, and also in greater national struggles—particularly in the Civil war when it was besieged and captured by the parl. forces under Gen. Lesley. Edward I. held his last Parliament in the castle and Mary Queen of Scots was kept here for some time, virtually a prisoner, by Elizabeth. In 1745 it surrendered to Prince Charles Edward but was quickly retaken by the duke of Cumberland. At the beginning of the nineteenth century great portions of the castle were pulled down (amongst them the banqueting hall where Edward I. had held his Parliaments). As it now stands it is in the care of H.M. Office of Works and is used as barracks and depot for troops of the Border Regiment. It also serves as the museum for the Border Regiment—the old 34th (Cumberland) and 55th (Westmorland) Regiments. The bishop's see was founded by Henry I. in 1133 and included the cos. of Cumberland, Westmorland, and regions of Lancashire lying N. of Morecambe Bay. The cathedral, originally the church of an Augustinian priory, built between the years 1092 and 1419, was once a noble edifice, cruciform in shape, but since the time of the Civil war, when the greater part of its Norman nave was pulled down and the stones used for military purposes, it has had the truncated appearance it now presents. It has a beautiful Early Eng. choir whose clustered columns have their capitals decorated with carved figures and flowers representing the occupations of the months

of the year. The choir stalls with their carved miserere seats are surmounted by graceful tabernacle work. The E. window, measuring 60 ft. by 30 ft. and having nine lights filled in with beautiful tracery, is considered to be the finest Decorated window in the kingdom.

The chief streets lead from the marketplace in front of the tn. hall. There are sev. interesting public buildings and institutions, including the old Guildhall, a well-equipped modern public library, and also a splendid museum and art gallery—the museum being rich in Rom. remains and having one of the best natural hist. collections to be found in the provs. C. grammar school was founded in 1170. The city is engaged in a great variety of industries, of which the chief are the manufacturing of textiles—calico, cretonnes, muslins, voiles, artificial silks, and Cumberland tweeds—also of carpets, hats, biscuits, sweets, tin boxes, and cranes. The centre of a large agric. area, it has also important live-stock markets. By the Licensing Act of 1921 the wholesale and retail licensed trade of Carlisle was transferred to the home secretary. With the object of supplying all reasonable demands whilst at the same time taking all possible care to avoid excess, the number of licensed houses was reduced and the others greatly improved—food being provided and served in rooms set apart for the purpose. The inns are in the care of managers with a district manager as head. The results of the scheme as far as C. is concerned are good. The estimated pop. of the city and co. bor. in 1947 was 64 000. It sends one member to Parliament.

Carlisle, tn. in Cumberland co., Pennsylvania, U.S.A., about 19 m. from Harrisburgh. Dickinson College was founded here in 1783, and there is also in the tn. an industrial training school for Amer. Indians. Pop. 14,000.

Carlisle, Sir Anthony (1768–1840), Eng. surgeon, first apprenticed to practitioners in York and Durham, then studied under John and Wm. Hunter in London. Member of College of Surgeons, and surgeon-extraordinary to the prince regent (George IV.); 1793–1840 surgeon to Westminster Hospital; F.R.S. 1800, contributing various treatises on physiology; 1808–25 lectured on anatomy at Royal Academy; knighted 1820; became president of the College of Surgeons, 1829. C. introduced the thin-bladed, straight-edged amputating knife. His writings were largely on anatomy; also on artistic and scientific subjects. One pamphlet, written in collaboration with W. Nicholson in 1801, was on galvanic electricity. See T. J. Pettigrew, *Medical Portrait Gallery*, ii., 1840; J. F. Clarke, *Autobiographical Recollections of the Medical Profession*, 1874.

Carlisle, Frederick Howard, fifth Earl of (1748–1825), Eng. statesman, educated at Eton and Cambridge. Up to the time of his appointment on a commission sent by Lord North to America he had spent his life in pleasure-seeking, but although

this commission had no result he proved himself capable of holding such posts. From 1780 to 1782, as lord-lieutenant of Ireland, he maintained peace and prosperity in that country. From 1789 until the Fr. Revolution he was in opposition to Pitt, but at that time he joined the opposite party, and after voting against the Corn Laws in 1815 he retired into private life.

Carlisle, George William Frederick Howard, seventh Earl of (1802-64), Eng. statesman, educated at Oxford, where he distinguished himself as a scholar. In 1826 he went to Russia, and in the same year was elected to represent Morpeth, having become Lord Morpeth in 1825. In 1830 he became member for Yorkshire, and in 1832 was elected to represent the W. Riding. From 1835 to 1841 he was chief secretary for Ireland, and in 1850 was made chancellor of the duchy of Lancaster. In 1855 Lord Palmerston appointed him lord-lieutenant of Ireland, which office he held till 1858 and from 1859 to 1861. He wrote a tragedy, *The Last of the Greeks* (1828), and two lectures, on the poetry of Pope and on his own travels in America (1850).

Carlists, the name given to the followers of Don Carlos de Bourbon (1788-1855) and his successors, who have in turn laid claim to the Sp. throne. Don Carlos was the brother of Ferdinand VII. (1808-1833). In 1824 many Spaniards were so discontented with Ferdinand that a plot was organised to depose him in favour of Carlos, but the latter firmly refused to countenance any rebellion. In 1830 Ferdinand was persuaded by his queen to alter the existing Salic law and appoint his infant daughter as his successor, to the exclusion of Don Carlos. The clerical party again tried to persuade the prince to head a revolt, but he once more refused, though declining to acknowledge the legality of the king's action. When Ferdinand *d.*, Carlos was engaged in assisting Miguel of Portugal against his rebellious subjects, and could not join his own partisans, who proclaimed him king, but were defeated. In 1834 he fled to England, returning soon to head a rising in Biscaya, which failed, and he again had to escape, after two years of adventure, in which he himself won no distinction. He *d.* in 1855; his son Carlos succeeded to his claim, but was expelled from France, and took no part in the abortive Carlist risings of 1846 and 1848. In 1860 he and his brother Ferdinand landed at Catalonia, but were captured, and only saved their lives by a humiliating surrender of their pretensions. Their brother John now put forward his candidature, afterwards resigning it to his son, Don Carlos VII., who raised a Carlist war in 1872, and for a time had some success, but was finally driven out of the country in 1876. After giving trouble in many countries he finally settled in Italy, where, through want of decision, he failed to avail himself of the opportunity which presented itself after the Hispano-Amer. war, when a discontented nation was not disinclined to look after his restoration as

the solution of their difficulties. His son Don Jaime was subsequently recognised as the legitimate pretender, but the recognition had no practical results. There was a striking resurgence of Carlism during the Sp. civil war, owing to the somewhat unexpected adherence of the Basque Nationalist and Catholic party to the Republican Gov. But it soon became evident that this resurgence did not mean that the remotely connected Bourbon prince (Don Jaime), whom Don Alfonso Carlos (1849-1936) is said to have named as his successor, would ever find any wide acceptance in modern Spain.

Carloforte, tn. of Italy, situated on the is. of San Pietro, near the coast of Sardinia. It has large salt works, and the zinc and lead mined in Sardinia are exported from the roadstead between this tn. and San Pietro. Pop. 7000.

Carloman: 1. Son of Charles 'Martel' and brother of Pepin. He succeeded his father in 741, and, with Pepin, repelled the Ger. invaders in 743. C. advanced into Saxony and captured the duke of Saxony. Later he entered a Benedictine monastery. 2. Younger brother of Charlemagne, with whom he in vain contested the Frankish kingdom. *D.* 771. 3. Second son of Louis II., whom he succeeded in 879. Proclaimed sole king of France on the death of his brother, Louis III. Killed while boar-hunting, 884. 4. Fourth son of Charles the Bald, a turbulent prince who, being accused of treason, had his eyes put out (*c.* 876).

Carlos, Don (1545-68), Sp. prince, only son of Philip II. of Spain, was from his boyhood of defective intellect and violent temper, and showed unmistakable signs of insanity; nevertheless an arrangement was made that he should marry Elizabeth, daughter of Henry II. of France, but soon after the death of Philip's second wife (Mary Tudor), that monarch cancelled his son's engagement and married Elizabeth himself. After an illness in 1562 the prince's derangement became more violent, and his vicious mode of life caused much scandal. In 1567 he was imprisoned on a charge of plotting to murder his father, and *d.* within six months after, under mysterious circumstances which have never been fully explained. He was generally believed to have been poisoned, but this has not been proved. In Motley's *Rise of the Dutch Republic*, the story of his life is vividly related, and sev. writers, including Schiller and Alfieri, have founded dramas upon it.

Carlos I. (1863-1908), king of Portugal, succeeded his father Luiz I. in 1889. He was a lover of peace, and encouraged literature (he was the author of the best translation of Shakespeare in the Portuguese language), science, and art, but the latter part of his reign was disastrous, owing to the policy of his chief minister, Senhor Franco. The king and his eldest son were assassinated in Lisbon, Feb. 1, 1908.

Carlota, La, tn. in the prov. of Cordova, Spain, 16 m. S.S.W. of the tn. of Cordova with manufs. of linen. Pop. 6000.

Carlovingians, or **Carolingians**, a Fr. dynasty, named after its greatest monarch Carolus Magnus (Charlemagne). About the year 623 Clotaire II., one of the Merovingian kings, gave his son Dagobert the kingdom of Austrasia (roughly speaking Lorraine and Franconia), with Pepin as mayor of the palace, whose son Pepin II. made himself master of both Austrasia and Neustria in 687, though he did not assume the royal title. His natural son, Charles Martel, seized the reins of gov. on his father's death, and became renowned as a warrior and administrator, but still contented himself with being 'duke' and chief minister to the nominal king. (For his great victory over the Saracens, see *Creasy's Decisive Battles*.) His son, Pepin III., put this bold question to the pope: 'Which has the greater right to the throne, the man who has the name and not the power, or he who has the power but not the name?' Receiving the answer he desired, he deposed Childeric, and became king, reigning from 752 to 768. He was succeeded by his son, Charlemagne, one of the greatest monarchs in European hist., both as conqueror and ruler. Extending his kingdom across the Pyrenees to the Ebro, eastward to the Elbe, the Bohemian Mts., and even to Croatia and Dalmatia, and southward to N. Afs. he was crowned by Pope Leo III. as head of the Holy Rom. Empire. He was a patron of learning, establishing schools and univs., in which he was greatly assisted by Alcuin of York. Charlemagne's son, Louis le Debonnaire, shared his domains between his sons, Charles II. taking France (840). Forty years later Charles III. reunited the empire but was deposed by Odo of Paris, and though there were other Carlovingian monarchs their authority was little more than nominal. The dynasty ended with Louis V., who was succeeded by Hugh Capet (987).

Carlovitz, see **KARLOVCA**.

Carlow: 1. Co. of Eire in the prov. of Leinster. Area about 349 sq. m., mostly arable. It is bordered by mts. in S.E. (Mt. Leinster), the rest being level or undulating. Chief tns., C., Tullow, Bagenalstown. Pop. 36,000. 2. Municipal bor., chief tn. of above co., on R. Barrow, about 50 m. from Dublin, on C. railway. Seat of Catholic bishop of Kildare. Till 1885 sent one member to Parliament. Ruins of an anct. Anglo-Norman castle dating from 1180 can be traced. There are flour-mills and much granite rock near by. St. Patrick's College was founded in 1795; in 1798 Irish rebels attacked the tn., but were repulsed. Pop. 7000. See J. Ryan, *History and Antiquities of Co. Carlow*, 1833.

Carloway, Doon of, remains of a circular tower at C., a tn. of Ross-shire, on the is. of Lewis in Scotland.

Carl Rosa Opera Company, formed by Carl August Nicolas Rosa (q.v.) in 1875. Became foremost private repertory opera company in the Brit. Isles.

Carlsbad, see **KARLOVY VARY**.

Carlsburg, see **KARLSBURG**.

Carlshamn, see **KARLSHAMN**.

Carlskrona, or **Karlskrona**, fortified seaport and naval station of Sweden, on five rocky is. in the Baltic, which are connected together and with the mainland by fourteen bridges. It was founded in 1680 by Charles XI. It has a magnificent harbour with a naval arsenal and dockyard. Pop. 28,000.

Carlson, Fredrik Ferdinand (1811-1887), Swedish historian and statesman, b. at Kungshamn, Uppland. He was educated at Upsala Univ., and held, among other posts, those of tutor to the Swedish princes, 1837-46; and prof. at the univ. of Upsala, 1849. In the National Diet he represented the univ. and then the Academy of Sciences of Stockholm from 1850 to 1865. His chief work is *Sveriges Historia under Konungarne af Pfalziska Huset* (a hist. of Sweden in 7 vols.) (1853-1870).

Carlsruhe, see **KARLSRUHE**.

Carlstad, see **KARLSTAD**.

Carlstadt, Andreas Rudolf Bodenstern af (1480-1541), Ger. theologian, b. at Karlstad. He was a prof. of Wittenberg Univ., and while studying theology in Rome he became imbued with the same doctrines as Luther. His views, however, were more advanced than those of the latter, and the two found themselves in opposition, as C. denounced the practices of the Church without limit. He was accused of taking part in the peasant's revolt and fled to Switzerland about the year 1525.

Carlton, tn. 3 m. from Nottingham, England, with a pop. of 22,000 principally engaged in mining and railway industries.

Carlton Club, so called from being near the site of C. House (famous during the Regency), the headquarters of Conservatism since its foundation by the duke of Wellington in 1832. The present building, 94 Pall Mall, was designed by Sir Robert Smirke. In 1922 the club was the scene of an historic meeting of the leading Conservative members of Parliament and others, when one section, under the lead of Mr. (later Sir) Austen Chamberlain, decided to continue to support Mr. Lloyd George and the Liberal wing of the Coalition party, and another section, comprising the larger body, broke away and decided to throw in their fortunes with Mr. Bonar Law, who became Prime Minister.

Carlisle, Scottish tn. in the co. of Lanarkshire, about 5 m. N.W. of the tn. of Lanark. It is a mining tn., and quantities of coal and iron are found here. It is also the centre of a fruit-growing dist. Pop. 10,500.

Carlyle, Alexander (1722-1805), Scottish minister. He took his degree at Edinburgh Univ. and afterwards went to the univs. of Glasgow and Leyden. In 1748 he became minister of Inveresk, a position which he held for the rest of his life. He adopted the views of the writer John Home, one of his friends (and was censured for attending Home's *Douglas*, 1757), and favoured the moderate party in the Church. He numbered among his friends Adam Smith and David Hume, as well as other men famous in the literary

world. Was nicknamed Jupiter C., on account of his fine presence and bearing. Moderator of the General Assembly. His *Autobiography* was pub. in 1860.

Carlyle, Alexander James (1861-1943), Scottish historian, son of Rev. J. E. C., minister of the Free Church of Scotland, Bombay; educated at Glasgow and Oxford Univs. He was ordained to the curacy of St. Stephen's, Westminster, 1888. Secretary to S.P.C.K., 1890-91; rector of St. Martin's and All Saints', 1895; examining chaplain to the bishop of Worcester, 1897-1901; became chaplain and lecturer in political science and economics at Univ. College, Oxford. In Aug. 1930 he was made canon of Worcester, and from 1934 until his death was hon. president of the International Institute for the Philosophy of Law. He wrote with his wife *Hugh Latimer* (1900); with his brother Sir R. W. C., *History of Medieval Political Theory in the West* (6 vols.) (1922-30); *The Christian Church and Liberty* (1924); and *Political Liberty* (1941).

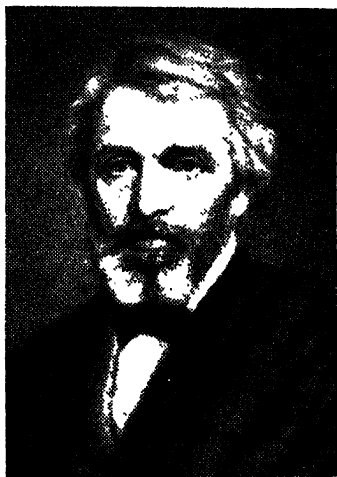
Carlyle, Jane Baillie Welsh (1801-66), wife of Thomas C. (q.v.); b. near Haddington, the daughter of Dr. John Welsh; among her ancestors were John Knox and Sir Wm. Wallace. As a girl she was a pupil of Edward Irving, who in 1821 introduced her to C.; they became great friends, and their friendship ripened into a stronger feeling. He was, however, in poor circumstances; Mrs. Welsh also discouraged his wooing, and a formal engagement was long postponed, but the wedding finally took place in Oct. 1826. For years C.'s income was small, and his wife, who was not used to hardships of which he made light, suffered in health and spirits. After sev. changes of residence, between Edinburgh and Craigenputtock, they moved in 1834 to London, and settled down in Chycyne Row, Chelsea. Here, as C.'s reputation increased, they made many friends, among others Lord and Lady Ashburton. This intimacy was in one way unfortunate; Mrs. C. thought herself slighted by Lady Ashburton, and said so; her husband thought her unreasonable, and she, greatly hurt, formed a circle of friends of her own. In 1857 Lady Ashburton d., a year later Lord Ashburton married again, and his second wife and Mrs. C. became close friends. But there were also other troubles, arising from C.'s bad health, irritable temper, and his constant worrying about every noise or other interruption to his work. All household anxieties fell on his wife, and she suffered much from loneliness while he was entirely engrossed in his books. He failed to notice this, and though kind in great things, often vexed her in little ones. They were warmly attached to each other, but both too nervous and highly strung for a peaceful union. In 1863 Mrs. C. was hurt in a cab accident, and the shock brought on serious results. Her husband, greatly troubled, did all he could to give her every comfort she required, but in 1866 she d. suddenly in her own carriage, and the shock completely overpowered

him. See *Letters and Memorials of Jane Welsh Carlyle*, prepared for publication by Thomas C., and ed. by J. A. Froude (3 vols.), 1883; *New Letters and Memorials*, ed. by Alexander C. (2 vols.), 1903; *Letters to her Family*, ed. by L. Huxley, 1924; *Letters to Joseph Neuherg*, 1848-1862, ed. by T. Scudder, 1931; also life by Townsend Scudder, 1939.

Carlyle, John Aitken (1801-79), younger brother of Thomas C., after studying medicine at Edinburgh and in Germany, tried to establish a practice in London, but failed; he then obtained a post as private physician first to the countess of Clare and afterwards to the duke of Buccleuch. In 1843, having saved a moderate competency, he settled near his brother, and devoted himself to literature. He began translating Dante's *Divina Commedia*, but only completed the *Inferno*, his rendering of which (pub. 1849) was highly praised; he also ed. Dr. Irving's *History of Scottish Poetry*. Settling in Scotland during the latter part of his life, in 1878 he founded two medical bursaries at Edinburgh Univ.

Carlyle, Thomas (1795-1881), Scottish historian and man of letters, the second son of James C. by his second wife, was b. on Dec. 4 at the little vil. of Ecclefechan in Dumfriesshire. After acquiring the rudiments of education from his parents, he went for a time to the par. school, and then, in 1805, to the Annan Academy, where for the first two years at least he was profoundly unhappy, finding his only comfort in omnivorous reading. He entered himself in Nov. 1809 as a student of Edinburgh Univ., and there he remained until 1813, when he came down without taking a degree. It was at this time that he began to prepare himself to take orders in the Church of Scotland, supporting himself the while by teaching. In 1814 he obtained the post of mathematical master at Annan Academy at a salary of about sixty pounds, and during the two years he was there he decided that he had not a call to the ministry. There seemed no career open to him except that of teaching, and from Annan he went to Kirkcaldy to take up a somewhat better paid position as assistant-master at the par. school. There he became intimate with Edward Irving, who was at this time head of a school in the same town, and fell in love with one of Irving's pupils, Mary Gordon, the 'Blumine' of *Sartor Resartus*. The friendship endured, but the love affair was nipped in the bud. By Nov. 1818, C. had come to the conclusion that schoolmastering was the most detestable occupation in the world, and, having saved seventy pounds, he threw up his post, and went with Irving to Edinburgh. It was his intention to become a lawyer, but he soon tired of the study of the law, and abandoned all desire to enter that profession. He contrived to pay his way by giving private lessons. Here he made his first plunge into authorship, writing articles for the *Edinburgh Encyclopedia*. Irving in 1821 introduced C. to Jane Baillie Welsh (q.v.), with whom Irving was in love, and desired to marry if he

could obtain his release from his engagement contracted earlier with a Miss Martin. C. was kept in ignorance of the state of affairs, and he too fell in love with the girl, who, after Irving's marriage in 1823, did not actually encourage him, but clearly could not bring herself to dismiss as a suitor. C. in 1822 became tutor to Charles and Arthur Buller, both of whom acquired some distinction in the world, at what seemed to him the splendid salary of two hundred a year. C. had soaked himself in Ger. literature for some years past, and these studies dictated his earlier works, *The Life of Schiller*, which, after



THOMAS CARLYLE

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appearing serially in the *London Magazine* in 1823 and 1824, was pub. in 1825; and *Wilhelm Meister's Apprenticeship*, a trans. of Goethe's novel, 1821. With Irving he had visited London in 1821, and made some acquaintances in literary circles; and after his return he persuaded Miss Welsh to become his wife. They were married on Oct. 17, 1826, and settled in Edinburgh, furnishing on the proceeds of *German Romance*, a vol. of trans. from Musaeus, La Motte Fouqué, Tieck, Hoffmann, Richter, and Goethe. He now depended entirely for his livelihood on his pen, and he was so fortunate as to secure admittance in 1827 to the *Edinburgh Review*, his first contribution being an essay on Jean Paul Richter. Soon he was in full work, writing for the prin. periodicals, the *Foreign Quarterly*, the *Westminster Review*, and *Fraser's Magazine*. It was in the last-named that in 1833-34 *Sartor Resartus* appeared, but it was so little popular that it was not until four years later he could find any one to bring it out in book form.

In the summer of 1834 he took up his residence at No. 5 Cheyne Row, Chelsea, London, and there he wrote *The French Revolution*, which appeared in 1837. He eked out a meagre income by delivering courses of lectures on Ger. literature, 'Heroes, Hero-worship, and the Heroic in History,' etc., but he hated the work, and was relieved when Mrs. C. came into her mother's small fortune in 1842, and he could devote himself exclusively to his books. He pub. *Past and Present* in 1843, and two years later gave to the world the epoch-making *Cromwell's Letters and Speeches*. *Latter-day Pamphlets* was issued in 1850, and the *Life of John Stirling* in the following year. He now devoted the greater part of his time to the composition of *Frederick the Great*, the first vol. of which appeared in 1858, and the last in 1865. Long before this he had been recognised as one of the leading men of letters in the kingdom, and a proof of the high esteem in which he was held was forthcoming in 1865, when he was nominated against Disraeli as a candidate for the office of lord rector of Edinburgh Univ., and was elected by 657 to 310 votes.

The death of his wife from heart disease, while driving in Hyde Park, on April 21, 1866, caused him much grief, and the rest of his life was embittered by the knowledge, which came to him too late, that he had, by his perverse ways and cross-grained temper, caused her great distress. He prepared for pub. her *Letters and Memorials*, but these were not pub. until two years after his death. He was much pleased when in 1874 the Prussian Order of Merit was bestowed on him, a compliment singularly appropriate, since Frederick the Great founded the order. In the same year Disraeli offered him the choice of a baronetcy or the Grand Cross of the Bath, which touched him to the quick, for, as he said, Disraeli was the only man of whom he had always spoken with contempt. The letters exchanged on this occasion were worthy of the writers, and will always find a place in any collection of the correspondence of great men. C. refused both honours, but he thought more kindly of the statesman ever after. He d. on Feb. 4, and a burial service at Westminster Abbey was offered, but, in accordance with his wish, his remains were interred at Ecclefechan. C. won his place in the world of letters with difficulty. *Sartor Resartus*, his first important work, that fantastic gospel of clothes, set more against him at the time of its pub. than it is easy now to conceive. *The French Revolution*, too, had its detractors, the true Carlylian style, in spite of its brilliance, annoying the critics. Yet the style was the man. No man could acquire such a style, it was born with him, and his imitators, who at one time were numerous, have paid the penalty of oblivion for their attempts to ape the master. 'His faults of style,' said that discerning critic, Leslie Stephen, 'are the result of the perpetual straining for emphasis of which he was conscious, and which must be attributed to an excessive

nervous irritability seeking relief in strong language, as well as to a superabundant intellectual vitality.' C. saw things so vividly that he was compelled to try to portray them vividly, and the conventional styles giving him no outlet, he made a style for himself, which is, however, always clear. *The French Revolution* marked him out as a writer of importance, and this impression was confirmed by his *Cromwell*, in which he gave a new, and probably truer, conception of the Protector's character. The fourteen years' labour that it took to produce *Frederick the Great* produced a work second only, if indeed second, to the *French Revolution*. As a picturesque historian C. has no equal. He had knowledge, as a matter of course; he had virility, and he had the power to convey his thoughts in a fashion so vivid that to read him once is never to forget him.

It has been said that all C.'s powers of persuasion as a religious teacher were devoted to that paganisation of Christianity which was the cultural aim of Nazism, coupled with inculcation of Carlylean hero-worship, 'burning and boundless,' for a leader. Certainly violence was irresistibly attractive to him. He praised it whether it showed itself in the excesses of a mob, in Cromwell's Irish massacres, in Frederick's ruthless meanness, or in events in his own lifetime. 'Though a tender-hearted man himself, there was a disagreeable amount of aesthetic cruelty in his make-up, and the gleams of beauty and of fantastic humour, cosmic and human which give his writings their value, are combined with much insincere rhetoric' (Desmond MacCarthy). His guiding principle in the interpretation of hist. was: Right must triumph; therefore might must be right. He tried to read that into hist. and his own faith depended on success. Yet time hardly diminishes his stature as an historian. He was greatest as an historian, and *The French Revolution* was by universal consent, his greatest hist. His highly documented life of Cromwell is the opposite of *The French Revolution*, both in its historical merits and its historical defects. But both works, with their opposite faults and opposite merits, left an ineffaceable mark on the Englishman's view of the Fr. Revolution and of the life and times of Cromwell. *The French Revolution* remains one of the greatest intellectual pleasures the world has to offer. 'Its humour, its pathos, its trenchancy, its dramatic power and insight into human nature, make it one of the greatest, though certainly the strangest of histories. It lacks very much that later histories of the revolution have got. But it has got those qualities they all lack' (Prof. G. M. Trevelyan). The prin. authority for C.'s life is his *Reminiscences*, ed. by J. A. Froude (1881) and in a better ed. by C. E. Norton (1887), who also ed. the *Correspondence with Emerson* (1883), with Goethe (1887), and *Letters of Thomas Carlyle, 1826-38* (1888). Froude's *Life* (4 vols., 1882-84) is not wholly reliable. See also R.

Garnett, *Life of Thomas Carlyle* (with bibliography), 1887; A. Carlyle (ed.), *Love Letters of Thomas Carlyle and Jane Welsh*, 1909; and the monumental *Life of Carlyle* by D. A. Wilson (6 vols.), 1923-34.

Carlyle, Thomas (1803-55), Scottish jurist, b. in Kirkcudbrightshire, was called to the Scottish Bar in 1824, and acted as defendant's counsel in the Campbell heresy trial, 1831. Joining the Irvingite church in 1832, he was in 1838 appointed 'Apostle' to N. Germany, and during his residence there wrote his *Moral Phenomena of Germany*, which attracted attention.

Carmagnola, tn. of Italy, in the prov. of Turin, situated on the R. Po. Its manufs. are silk and jewellery, and it trades in corn and cattle. Pop. 13,000.

Carmagnola, Francesco Bussone, Count of (1390-1432), one of the *condottieri*, b. at Carmagnola in Piedmont, Italy. He entered the service of Filippo, duke of Milan, who raised him to the rank of count and made him governor of Genoa. His success in the field roused the duke's jealousy, and before long there was a coolness between them, ending in a definite rupture. C., in revenge, offered his services to the Venetians. The political situation of Venice made his assistance most welcome, and the fact that the duke had tried to poison him gave the senate confidence in his loyalty to them. He defeated the duke's army at Macclodio, and took Brescia from him. After this peace was made, lasting for only one year. On the renewal of hostilities C. again took command, but he was also in communication with the duke, who tried to seduce him by bribes. His indifference resulted in reverse and failure, and the senate, tired of his duplicity, enticed him to Venice, where he was brought before the Committee of Ten, tried, tortured to extort a confession of guilt, and beheaded.

Carmagnole (from Carmagnola, N. Italy): 1. Peasant costume of Piedmont and the Midi, carried by S. revolutionaries to Paris in 1793. 2. Wild song and dance which went with the costume, and were in great favour with the revolutionaries during the Terror in Paris. The refrain of each verse was:

Vive le son, vive le son.
Dansons la Carmagnole, vive le son du canon!

Carman, William Bliss (1861-1929), Canadian poet, b. at Fredericton in New Brunswick, April 15, 1861, son of Wm. Carman, and related on his mother's side to R. W. Emerson. Educated at the collegiate school of Fredericton, and the univs. of New Brunswick, Edinburgh, and Harvard. He became a journalist, and from 1890 to 1892 was office editor of the *New York Independent*. His chief poetical publications were: *Low Tide on Grand Pré*, the earliest and perhaps the best (1893); *Ballads of Lost Haven* (1897); *Songs from Vagabondia* (with Richard Hovey) (1894), with various continuations—the last in 1901; *Behind the Arras* (1895); *A Winter's Holiday* (1899); *Christmas Eve at St. Kevin's* (1901);

Ballads and Lyrics (1902); *The Word at St. Kevin's* (1903); *Songs from a Northern Garden* (1905); *The Rough Rider and other Poems* (1909); *April Airs* (1916); *Later Poems* (1921); *Far Horizons* (1926); *Wild Garden* (1929). In a prose work, *The Kinship of Nature* (1904), he developed his philosophy of nature-worship. In April 1929 the Royal Society of Canada awarded him the Lorne Pierce medal for contributions to Canadian literature.

'Carmania,' steel turbine steamer, triple screw, owned by the Cunard line. It was built by J. Brown & Co. Ltd., of Glasgow, in 1905, and launched at Clydebank. Length 650 ft., breadth 72 ft., speed 20 knots. As an armed merchant ship, it was severely damaged in action with a Ger. armed merchant ship in the S. Atlantic in Sept. 1914, when the Ger. ship was sunk. After the war it was refitted and operated in the Liverpool-New York and London-Boston-New York service until 1931. It was sold to ship-breakers in 1932.

Carmarthen, co. tn. of Carmarthen-shire, Wales, situated on the R. Towy. It is built on the site of the Rom. fort of *Mardunum*, and possesses the remains of a Norman castle. Though of great antiquity and legendary fame, it has few old buildings. Once the prin. centre of the Welsh wool trade, it has now sev. important industries. Originally a parl. bor., since the sixteenth century it has given its name to one of the two parl. areas into which Carmarthenshire is divided. Pop. 10,000.

Carmarthen Bay, large opening on the S. coast of Wales, chief tns. Tenby (Pembrokeshire) and Llanelly.

Carmarthenshire, co. of S. Wales, area 918 sq. m.; chief rvs. the Towy, Taf, and Teifi. On the S.E. border Carmarthen Van, in the Black Mts., rises to 2632 ft., and Mynydd Mallan in the N.E. to 1430 ft.; there are many other groups in the co., mostly grassy hills under 1000 ft. The valleys are fertile, and the hillsides afford good pasturage. The co. produces coal, slate, limestone, clay, and some lead, but its industries are chiefly agric., especially dairy-farming and stock-raising, the coal-mining, iron-founding, and smelting works being confined to the S.E. Along the coast there are extensive sands and marshes. There are two co. parl. divs., Carmarthen and Llanelly. Pop. 180,000. The antiquities of C. are numerous and interesting, including Brit. and Rom. remains, and many medieval ruins. Old Welsh folk-lore and superstitions linger in the valleys, and the traditional beaver hats and plaid shawls are hardly yet extinct.

Carmathians, see KARMATHIANS.

Carmaux, tn. of S. France in the dept. of Tarn, on the R. Cérour, 10 m. N. of Albi. There are coal mines in the neighbourhood, also brick and glass works. Pop. 11,000.

Carmel, Mount, range of mts. in Palestine 18 m. long, extending from the plain of Esdraelon in a N.W. direction through the plains of Sharon to the bay of Acre, where it terminates in the only promon-

tory on the Palestine coast. The highest point is 1810 ft. It is very fertile and beautiful, and hares, partridge, quail, woodcock, and jackals are found. El-Mahragah ('the place of burning'), a cliff 1700 ft. above sea level, is the reputed scene of Elijah's sacrifice, and close by is the cave in which he is said to have lived. According to Tacitus, a god Carmel was worshipped here. Towards the N. end are sev. hotels and pensions, and, within recent years, it has become a popular residential area for the inhab. of Haifa and for summer visitors.

Carmelites, Order of, or Friars of our Lady of Mount Carmel, commonly called in England White Friars, on account of their grey scapular, was founded in 1156 by an It. crusader, Berthold, who estab. a hermitage on Mt. Carmel with some few companions. It was believed by many, however, that a succession of anchorites had occupied this spot from the time of Elias till that of Christ, and that, its members being then converted, the community had continued without a break. The controversy on this question reached its height in the seventeenth century, and was only stopped by a papal edict in 1698. In 1238, the C. were driven out of Palestine by the Saracens, and settled in Cyprus, then spreading throughout Europe. Their rule was modified to suit the W. climate, and the C. were in 1247 changed by Pope Innocent III. from hermits into mendicant friars. In England they flourished greatly, and possessed fifty-two houses at the dissolution of the monasteries. In the fifteenth century an order of Carmelite nuns was founded, with a lax rule, which St. Teresa in 1562 attempted to restore to its primitive austerity. This rule was taken up by the men and resulted in the formation of a new order of Discalced or Barefooted C., which prospered far more than the old order. See A. de St. Marie, *L'Ordre de Notre-Dame du Carmel*, 1910.

Carmen, port of Mexico in the state of Campeche, Yucatan. It is situated on the is. of C., and possesses a good harbour. There are exports of dye woods. Pop. 7500.

Carmen Sylva, pen-name of Elizabeth (q.v.), queen of Rumania.

Carmichael, James Wilson (1800-68), Eng. painter, b. at Newcastle-on-Tyne. He was chiefly known for his pictures of marine subjects; wrote two works of some value: *The Art of Marine Painting in Water Colours* (1859), and *The Art of Marine Painting in Oil Colours* (1864). His pictures were exhibited at the Royal Academy and elsewhere, his first appearance being in 1838. He painted in London from 1845 to 1862, when he went to Scarborough, where he d.

Carmignano, tn. of Italy, in the prov. of Tuscany, 13 m. N.W. of Florence. The manuf. of straw plait and hats is carried on, and there is an export trade in wine. Pop. 13,000.

Carmina Eburna, collection of songs, mostly in Lat., but some in Ger., written by Goliards or wandering scholars of the twelfth and thirteenth centuries. These

men were clerks, and the songs have generally the form of hymns. They vary greatly in character, some being lofty in tone, others worldly, satirical, and even distinctly immoral. The MS. is now at Munich, but was once kept at the abbey of Benediktbeuren in Bavaria, whence the songs derive their name. See ed. by A. Hilka and O. Schumann, 1930.

Carminatives, remedial agents which relieve flatulence, colic, etc. The ordinary condiments, as pepper, mustard, ginger, cinnamon, cloves, nutmeg, peppermint, may be used as C. They are also used in conjunction with purgatives to prevent painful griping and as gentle tonics to stimulate digestion.

rows. Here and there the rows are irregular, the gaps being accounted for by the houses in the neighbourhood, for which the peasant builders have utilised this conveniently accessible stone. There are various groups of menhirs round C., situated at Kermario (place of the dead), Kerlescan (place of burning), Erdeven, and Saint-Barbe. The object and origin of these stones are uncertain. Rom. remains were found about 1½ m. away from C. when the Bossenno, another group of mounds, was explored by Miln, 1874-1880. Pop. of com. 29,000.

Carnac, see **Karnak**.

Carnahuba, **Carnuba Palm** (*Copernicia cerifera*), Brazilian palm which is of



D. McLeish

THE MENHIRS OF CARNAC

Carmine, red colouring matter obtained from the cochineal insect. It was discovered in 1756 by a Franciscan monk at Pisa, whilst conducting experiments in medicine. In manufacturing C. the cochineal is exhausted with boiling water, and the colouring matter precipitated by the addition of acid or acid salt.

Carmona, tn. of Spain in the prov. of, and 20 m. N.E. by E. of the city of, Seville. It is visited by the residents as a holiday resort. The manufs. are woollen goods, leather, and earthenware, and it trades in wine, olive oil, and grain. Pop. 23,000.

Carn, see **CAIRN**.

Carnac, vil. in the dept. of Morbihan, France. It is famous on account of the great megalithic monuments in the neighbourhood. Long avenues, consisting of thousands of blocks of rugged grey granite, extend over 1½ m. of heath. The blocks are in the form of obelisks with the apex reversed: none are more than 18 ft. high. These menhirs, or standing stones, are in eleven parallel

handsome appearance and great use. The under part of the leaves exudes quantities of wax which is manufactured into candles and serves to adulterate beeswax.

Carnarvon, co. tn. of Carnarvonshire, N. Wales. It is situated on the Monal Straits, and is 63 m. W. of Chester by rail. It was once the Rom. station *Caer Seint*, the cap. of the Segontiaci. The castle, one of the finest examples of medieval fortification in the Brit. Isles, lies to the W. of the tn. It was built by Edward I. in 1284, and is in excellent preservation. It is an irregularly shaped building with thirteen polygonal towers; the famous Eagle Tower was built by Edward II. The castle was besieged by Owen Glendower in 1402. The investiture as Prince of Wales of Prince Edward took place at the castle on July 13, 1911. The par. church lies outside the tn. at Llanbilly. A ferry connects Tal-y-Foel with C. The tn. is a municipal bor. and market, and with other bors. returns one member to the House of Commons. The chief industries are shipbuilding, fishing, and

tanning; slate and copper ore are also exported. Pop. 8500. C. Bay, to the S., is a very favourite summer resort.

Carnarvon, dist. and tn., N.W. of Cape of Good Hope prov., S. Africa, 102 m. N.N.W. of Beaufort W. For the most part the dist. is very dry, but it is possessed of an immense reservoir, the Van Wyk's Vlee. Pop. tn. (white) 1000.

Carnarvon, George Edward Stanhope Molyneux Herbert, fifth Earl of (1866-1923), Eng. Egyptologist, b. June 20, at Highclere, Berkshire, eldest son of Henry Howard Molyneux, fourth earl. Educated at Eton, and at Trinity College, Cambridge. He succeeded to the earldom June 28, 1890. With Howard Carter (*q.v.*) he undertook the excavation of the tombs of the twelfth and eighteenth dynasties in Egypt in 1906. He pub. *Five Years' Exploration at Thebes* (1912). In Nov. 1922 Mr. Carter discovered the tomb of Tut-ankh-Amen of the eighteenth dynasty at Luxor. Shortly after, however, on April 23, 1923, the earl d. at Cairo of erysipelas and pneumonia resulting from a mosquito-bite.

Carnarvon, Henry Howard Molyneux Herbert, fourth Earl of (1831-90), Eng. politician, succeeded to the title in 1849. After taking his degree at Oxford, he took a prominent place as a member of the House of Lords, and in 1858 was made under-secretary for the colonies, succeeding to the secretaryship of state in 1866. He introduced the Bill for federating the Canadian provs., the N. America Act; but resigned office owing to the disapproval of the Reform Bill of 1867. In 1874 he again joined the Conservative Cabinet, but resigned in 1878 over the E. question and Disraeli's policy. In 1885 he was made lord-lieutenant of Ireland and came into conflict with Parnell over a private interview in which he was alleged to have made overtures on behalf of the Conservative party in regard to Irish Home Rule. He again resigned. In 1887 he advised the investigation of *The Times's* charges against Parnell.

Carnarvonshire (Welsh, *Caer-narfon*, *Caer-yn-Arfon*), co. of N. Wales, bounded N. by the Irish Sea, E. by Denbigh and Merioneth, S. by Cardigan and Tremadoc Bays, W. by Carnarvon Bay and the Menai Straits, dividing it from Anglesey. The area is 569 sq. m. A large part of the co. is occupied by the Lleyn Peninsula jutting out into the Irish Sea and forming Carnarvon and Cardigan Bays. A small portion of the co. is detached on the N. coast of Denbighshire. C. contains some of the finest scenery in Wales, with splendid mts. and beautiful valleys. The mts. include Snowdon (Wyddfa or Eryri), 3560 ft., the highest point in England and Wales, at its foot lie the well-known valleys of Biddgelert and Llanberis. The centre of the co. is the most mountainous, with Carnedd Llewellyn (3484 ft.), and Carnedd Dafydd (3426 ft.). The tidal R. Conway is navigable for about 12 m. and divides Carnarvon from Denbigh; the Nant Ffrancon runs through the Bettwy-Coed valley to Beaumaris Bay; the co.

also boasts of many lovely lakes, and places of resort, such as Cricieth, with its castle, Penmaenmawr, near the Great Orme's Head, Llandudno, etc. Lead, copper, and some gold are found, and the slate quarries, especially those at Penrhyn, are most productive. Sheep and dairy farming are carried on in the valleys, and the Welsh ponies are bred here. In ant. times C. was inhabited by the Segontiaci; from here Agricola effected the conquest of Anglesey; many remains of Brit. earthworks, etc., are to be found in various parts of the co. C. is in the diocese of Bangor, with a small portion in St. Asaph. It returns one member to the House of Commons. Pop. 121,000.

Carnatic, or **Karnatic**, European name of a region of S. India, lying between the Coromandel coast and the E. Ghats. It now forms part of Madras. In the eighteenth century it was ruled by the Nawab Sa'adat-Allah of Arcot and his successors, and was the centre of the struggle for supremacy in India between France and Great Britain. In 1801 it came under Brit. rule. The dist. abounds in temples, some of great age and beauty. The pop. consists chiefly of Brahmanical Hindus.

Carnation, name given to many double-flowering varieties of plants which have sprung from *Dianthus caryophyllus*, the clove-pink, a beautiful specimen of Caryophyllaceae. They are cultivated in Britain, and range in colour from red to white, yellow, and violet, and many of them are variegated. They never occur in a wild state, but they are hardy and require only a rich, light soil in which to bloom. Propagation may be effected by means of layering, cuttings, and seeds, but the most successful of these methods is by layering.

Carneades (215-130 B.C.), Gk. sceptic philosopher, b. at Cyrene, was the successor of Arcesilaus (315-241 B.C.), founder of the Middle Academy, which embraced the new sceptical reaction against the dogmatism of the dominant schools and as a weapon against the stoics. More is known of his teaching than his life. His masters were Diogenes, the Stoic, and Hegesinus. His chief study was the works of Chrysippus, by exposing whose fallacies he estab. his own philosophy. By C., scepticism was carried over into the realm of ethics as well; and it is narrated that while on a political embassy to Rome in 156, he created a sensation by arguing most eloquently in a public discourse on behalf of justice; and then the next day speaking with equal effect against it. But the fact that his eloquence and brilliant argumentation incited the young Romans to study philosophy was displeasing to Cato, who expelled him.

Carnegie, tn., Allegheny co. Pennsylvania, U.S.A., 6 m. S.W. of Pittsburgh. It was formed into a bor. in 1894, and gains its name from Andrew C. (*q.v.*). It possesses large steel and iron works; there are alkaline and lithia mineral springs hard by. Pop. 12,500.

Carnegie, Andrew (1835-1919), Amer.

manufacturer and philanthropist. b. at Dunfermline in Fifeshire, Scotland, Nov. 26, 1835; elder son of Wm. C., damask-linen weaver. In 1848, his parents emigrated to America, settling at Allegheny City, Pennsylvania. The boy entered a cotton factory as a weaver's assistant, and for some time his wages were a little over one dollar per week. At the age of fourteen he became a telegraph boy in Pittsburgh, and learned to telegraph. Then, joining the Pennsylvania railroad, he became telegraph operator, and ultimately rose to be superintendent of the Pittsburgh div. It was at this time that he laid the foundation of his fortune by the introduction of sleeping-cars on the railway, and by his successful investments in oil lands near Oil City. It was after the Civil war, during which he had rendered valuable service to the gov. as superintendent of military railroads, that his great work began, in the development of the Pittsburgh iron and steel industries. He estab. the Keystone Bridge Works and the Union Iron Works, for the manuf. of steel rails. He then built the Edgar Thomson Steel Works, and in 1883 acquired the Homestead Steel Works. His sphere of business extended with great rapidity, until in 1901 the whole of the vast C. enterprise was taken over by J. Pierpont Morgan, as the U.S. Steel Trust, and C. himself retired from business. From that time, he lived somewhat in the manner of a Scottish laird, at Skibo 'Castle' in Sutherland. Public attention was fixed by the manner in which C. utilised his vast wealth for philanthropic purposes. Chief among his works was the provision and equipment of libraries in England and Eng.-speaking countries. He distributed over £10,000,000 for this purpose alone. For the benefit of Scottish education, he gave in 1901 a sum of £2,000,000 to provide class fees for students, and he also made presentations to Eng. and Amer. univs. In 1903 C. founded the Dunfermline Trust with an income of £25,000, for the improvement of his native tn. He also erected homes and provided funds for his old employees. The C. Hero Fund was started in 1901 for the U.S.A. and Canada; in 1908 for the United Kingdom. Its purpose is 'to place those following peaceful vocations who have been injured in an heroic effort to save human life, in somewhat better positions pecuniarily than before, until again able to work.' He d. at Lenox, Massachusetts. See also CARNEGIE TRUST FUNDS. C.'s pubs. include *An American Four-in-hand in Britain* (1883); *Round the World* (1884); *Triumphant Democracy* (1886); *The Gospel of Wealth* (1900); *Empire of Business* (1902); *Problems of To-day* (1908); *Autobiography* (1920). See B. J. Hendrick, *The Life of Andrew Carnegie*, 1933.

Carnegie Trust Funds. The Carnegie Corporation of New York, incorporated by an Act of the New York legislature in 1911, which constituted Andrew C. (q.v.), Elihu Root, and others, and their successors, a body corporate to receive funds and apply the income to the

advancement of knowledge among the people of the U.S.A. by aiding technical schools, institutions of higher learning, libraries, scientific research, hero funds, useful pubs., and by other appropriate means. For its corporate purposes, C. transferred to the corporation \$25,000,000 par value first mortgage gold bonds of the U.S. Steel Corporation. The total endowment is over \$130,000,000. Andrew C. was the first president and Elihu Root the first vice-president of the corporation. Other C. trust funds are the *Carnegie Foundation for the Advancement of Teaching*, instituted in 1906 to apportion adequate retiring allowances to univ. profs. and lecturers, and to teachers in technical schools of the U.S.A., Canada, and Newfoundland. Its total endowments and reserves are over \$30,000,000. *Carnegie Institution of Washington*, originally organised under the laws of the dist. of Columbia and incorporated as the C. Institution, and reincorporated in 1904. Its purpose is to encourage investigation, research, and discovery. The various divs. of the institution include the depts. of embryology, genetics, historical research, meridian astrometry, terrestrial magnetism; the laboratories of geo-physical and nutrition research, and the Tortugas laboratories; the Mt. Wilson Observatory; and the dept. of early Amer. hist., including Middle Amer. archaeological research. *Carnegie Trust for Universities of Scotland*, constituted in 1901 to administer a sum of \$10,000,000, in bonds of the U.S. Steel Corporation, given by Andrew C. for improving and extending the opportunities for scientific study and research in the univs. of Scotland. *Carnegie United Kingdom Trust*, constituted in 1911 with the object of devoting its income to the 'improvement of the well-being of the masses of the people of Great Britain and Ireland by such means as are embraced in the meaning of the word "charitable" in Scots and Eng. law.' The trustees concentrate on the development of public libraries by grants to municipal libraries for the purchase of books and by grants in aid of co. library development and grants to important special libraries which are prepared to lend books through the Central Library for Students. In rural development, the trustees support the National Council of Social Service and Rural Community Councils. Its income is over £100,000 a year. The *Carnegie Endowment for International Peace*, instituted in Washington in 1910 has depts. for international relations and education, international law, and national economy and hist.

Carnelian, or **Cornelian**. (Low Lat. *carneolus*, from *carneus*, flesh-coloured, though some say the original spelling was *Cornelian*, derived from Lat. *cornu*, horn, from the appearance of the stone when fractured (others dubiously refer 'cornelian' to the fruit of the cornel), reddish variety of chalcedony (q.v.), but sometimes brown, yellow, or white. Usually bright and clear. Found chiefly at Cambay, India. Composition: silica

(98 per cent), peroxide of iron, magnesia, alumina, potash, and soda. Used for engraved seals.

Carnforth, tn, in the co. of Lancashire, England, about 6 m. from Lancaster by rail. Its chief industry is iron. Pop. 3000.

Carnières, tn, of Belgium in the prov. of Hainaut, on the route from Mons to Charleroi. There are stone quarries, coal mines, and iron works in the neighbourhood. Pop. 9000.

Carniola, mountainous dist. in Yugoslavia, S.W. of Austria, with its coast on the Adriatic. Has quicksilver mines, grape vines, and other fruit.

Carnival (*carnem*, flesh, *levare*, to lighten).

This feast is named the Carnival, which being

Interpreted implies 'farewell to flesh.'

BYRON, *Beppo*, vi.

It commenced on the feast of Epiphany, or Twelfth Day, and ended on Shrove Tuesday, but was afterwards restricted to eight days before Ash Wednesday, the feast preceding the long fast. Its origin was doubtless the Saturnalia of the pagan Romans, who on becoming Christian incorporated many of their rites and customs in their new religion. In Rom. Catholic Germany, *Fasching*, as the C. was called, was the precursor of the drama, and at Nuremberg the first Fast Eve's play was produced. This developed later into masques and mysteries. In Germany only the Catholic cities of the Rhine formerly kept the festival, but it has been revived in Hamburg, Leipzig, and Berlin. As a rule, Protestant countries do not observe it. Italy is the country in which it is most celebrated. On Shrove Tuesday, after sunset, every one sollices forth with a lighted taper. The object is to put out as many tapers as possible of other people while preserving their own alight. Special names were given to the chief days, viz. Greasy Sunday, Blue Monday, or Fools' Consecration. On the Sunday before Lent the procession of the Bœuf Gras takes place, the animals being led through the streets by butchers in costume. At the Nice C. *mi-carême*, an effigy of King C. is paraded through the streets.

Carnivora (Lat. *carnem*, flesh, *vorare*, to devour) form in zoology an important mammalian order. As the name implies, the members are all flesh-eaters, but they are not the only creatures which feed on their fellows—the diet of blood-sucking bats and some marsupials, such as the opossum, bear evidence to this fact—and many of these so-called carnivorous animals are either omnivorous or largely herbivorous. The order is usually divided into the sub-orders Fissipedia, or terrestrial members of the group, and Pinnipedia, or the aquatic forms, with flippers for limbs; the latter div. is, however, by some zoologists considered to be a separate, though nearly allied, order. The characteristics of the C. are the sharp teeth, small incisors, well-developed brain, simple stomach, reduced

or absent cæcum, zonary placentation, incomplete or absent clavicles; there are never less than four toes on each foot; the scaphoid and lunar bones are fused in the manus (hand); and the claws are generally sharp and powerful. In the Fissipedia the most typical feature is the dentition, which is obviously adapted to the mode of life of the animals. There are nearly always six pointed incisors in each jaw, and two long powerful canines. The cheek-teeth vary in number, but the last premolar in the upper jaw and the first true molar in the lower differ from the others in their larger size, and are called *carnassial* or *sectorial*; in front of the carnassial tooth are grinders with cutting edges, and behind are others which are broad and tuberculated. In the Pinnipedia there is no carnassial tooth, the incisors are never less than two in each jaw, and the cheek-teeth do not vary in formation. The mode of progression in the former sub-order is digitigrade, semi-digitigrade, or plantigrade; in the last the pes and manus are both fully webbed for swimming purposes, but the hind limbs may be used when the animals travel on land. Considerable difficulty is experienced in classifying the C., but the usual plan among the terrestrial forms is to divide them into three groups, the *Achiroidea*, represented by the cats (including the tiger, leopard, lion, etc.), the *Cynoidea* by dogs, and the *Arctoidea* by bears. The Pinnipedia consists of the walrus and various seals. Fossil species of both sub-orders have been abundantly discovered, and have proved of great scientific interest. The geographical distribution of the animals is world-wide but for Australia and New Zealand, and our domestic pets include two typical representatives in the dog and the cat.

Carnivorous Plants, see INSECTIVOROUS PLANTS.

Carnmoney, par. of N. Ireland in co. Antrim, 5 m. N. of Belfast. Agriculture is the chief employment, and flax spinning is carried on. Pop. 9600.

Carnot, Lazare Hippolyte (1801-88), Fr. statesman, was the second son of Gen. Lazare N. Marguerite C., b. at St. Omer. He shared his father's exile till 1823, and on his return devoted himself to literature and philosophy. Entering politics, he was elected deputy for Paris, 1839, becoming one of the leaders against Louis Philippe; he was minister of education in 1848, and retired on refusing to take the oath to the Emperor Napoleon.

Carnot, Lazare Nicolas Marguerite (1753-1823), Fr. soldier and statesman, b. at Nolay, Burgundy, France. He entered the Fr. Army, 1784, as an engineer, having obtained a captaincy on the completion of his studies at the military school of Mazières. In 1786 he pub. his celebrated *Essai sur les machines en général*. In 1791 he became a member of the National Assembly and an influential power on the Committee of Public Safety. He fled to Germany, and there wrote a defence of himself, which caused his colleagues' ruin. He was recalled to Paris in 1800, and became

minister of war, conducting the It. and Rhendish campaigns with great credit. This ended, he retired from public life, and wrote his *Traité de la défense des places*. Again in 1814 France was in difficulty, and C. came forward to help, magnificently defending Antwerp against the allies. He was minister of the interior during the Hundred Days.

Carnot, Sadi Marie François (1837-94), Fr. president, the eldest son of Lazare Hippolyte C. A strong Republican, he was elected to the National Assembly in 1871 and joined the ministry in 1878; in 1880 he was minister of public works, and in 1885 minister of finance. In 1887, after the 'decoration scandals,' he was elected to the presidency and had to meet the danger from the anti-Republican movement under Gen. Boulanger; his success was repeated during the Panama scandals of 1892, and his ability and integrity were proved. In 1894 he was assassinated by an It. anarchist, Caserio, after speaking at a public banquet at Lyons.

Carnotite, vanadate of uranium and potassium, containing a high percentage of uranium oxide; occurs in Utah and Colorado as a yellow sediment. It is a source of both uranium and radium.

Carnoustie, tn. and police burgh in S.E. Angus, Scotland, 10 m. E.N.E. of Dundee. It is a favourite watering-place on the North Sea, with excellent sea bathing and golf. The large artillery and camping grounds, known as Barry Links, are in the neighbourhood. Pop. 6000.

Carnuntum, Rom. fortified station, of which the remains exist near Hainburg, in Lower Austria. It was the centre of Rom. military operations on the Danube, and of the trade in amber from the N. belonging first to Noricum and later to Pannonia. The name connected with *karn*, cairn, points to its Celtic origin.

Carnutes, Celtic tribe of central Gaul, between the Seine and the Loire. The chief tns. were Cenabum (not Genebun), now Orléans, and Chartres. They were subdued by Julius Cæsar, and in return for military services retained their institutions under Augustus, becoming *federati* of the Rom. Empire.

Carnwath, par. and vil. of Scotland in Lanarkshire, 27 m. S.E. of Glasgow. Coal and iron are obtained in large quantities from the neighbourhood. Pop. of par. 5250.

Caro, Annibale (1507-66), It. poet, b. at Civita Nuova in Ancona. He was tutor and secretary in a rich Florentine family, named Gaddi, and was presented to an eccles. benefice in Rome. In 1543 he became the confidential secretary of Pietro Lodovico, duke of Parma, and afterwards to his sons. His best-known works in verse include translations from the classics, especially a fine one of the *Æneid*, a comedy *Gli Straccioni*, *Rime e Canzoni*, sonnets, and an amusing eulogy of the big nose of the president of the Accademia della Virtù, Leoni Ancona. His prose works consist chiefly of translations from Aristotle. His poetry is marked by high qualities, and his letters

by remarkable finish of style. He d. at Rome.

Carob-tree, see *CERATONIA SILIQUA*.

Carol (O.F. *carole*, a dance with song), in accepted Eng. usage, a song for the Christmas festival. Diez suggests that the origin of the word is 'chorus'; others derive it from *corolla*, a little crown or garland. The earliest meaning applied to the word seems to have been a 'ring-dance' or 'to dance in a circle.' Stonehenge, once called the giants' dance, was also the Giants' carol. Dancing and singing were part of religious worship from the earliest times. Caroling, dancing with singing, was handed on from pagan ritual to the Christian Church. In 1209 the Council of Avignon forbade dancing and secular singing in churches. In the cathedral of Seville the choristers perform a castanet dance round the lectern thrice a year. Caxton, in the *Golden Legend*, refers to the 'carolles of virgins,' and Chaucer uses the word in 'I saw her dance so comely, carol and sweetly sing.' In Spain many early Cs. refer to gipsy girls dancing and singing. The Manx people have a collection of Cs., locally called 'carvels,' which were sung in the churches on Christmas Eve, each singer bringing with him a candle. Most of these Manx Cs. consist of tales of judgment day and hell, and not of the Nativity or the joyful themes of Christmas-tide. The Bretons have also a large collection of anct. Cs. The earliest printed collection was issued in 1521 by Wynkyn de Worde; this contains the famous *Boar's Head Carol*, still sung at Queen's College, Oxford, to usher in the boar's head. There are numerous collections of Fr. Cs., called *Noëls*, and sev. Ger. *Wiegenslieder*, cradle-songs associated with the Babe of Bethlehem, the lullaby *Dormi, Fili*, being one of the best known. Some of the fifteenth-century Cs. are very quaint, and embody curious legends, such as the *Cherry Tree Carol*, and the familiar 'I saw three ships come sailing by.' That the singing of Cs. as an excuse for the asking of alms was a very early custom seems likely from an Anglo-Norman C. now in the Brit. Museum. The word C. is freely used by poets in reference to people or birds singing joyously, such as in Tennyson's *Elaine*, 'carolling as he went a true-love ballad,' or in Spenser's *Epithalamion*, 'the cheerful birds do chaunt their lays and caroll of love's praise.' See W. S. Rockstro, *Thirteen Carols of the Fifteenth Century*, 1891; E. Rickert, *Ancient English Christmas Carols*, 1910; and *The Early English Carols*, ed. by R. L. Greene, 1935.

Carol II., king of Rumania, see *CHARLES II.*

Carolan, Turlough, see *O'CARLON, TOR-LOCH*.

Carolina, North and South, see *NORTH CAROLINA*; *SOUTH CAROLINA*.

Caroline, Amelia Elizabeth, of Brunswick (1768-1821), queen of George IV., was the daughter of Charles Wm. Ferdinand, duke of Brunswick, and of Princess Augusta of England, a sister of George III. She was a bright, headstrong, foolish

woman of thirty-one when she came to England to marry the Prince of Wales. The marriage was unhappy from the wedding-night, when the bridegroom was drunk. After the birth of a daughter, Charlotte, a separation took place, and the princess went to live at Blackheath. In 1806 an inquiry was made into the charges of adultery brought against her by Lady Douglas, but the commissioners decided that she was guilty of nothing worse than indiscretion and that Lady Douglas had committed perjury. The matter was reopened by the prince six years later, with the same result. Weary of continual persecution at the hands of her consort, she went abroad in 1813. When she became queen seven years later, she returned to England. She was now tried before the House of Lords for misconduct with Bergami but the bill was not proceeded with. So strong was the feeling in her favour, that had she been found guilty it is in the highest degree probable that George IV. would have lost his throne. A few days after the coronation, at which she was not even permitted to be present, she d. As her coffin was borne through the metropolis on its way to Brunswick, the people showed their sympathy with her by attacking the military, and, in defiance of the authorities, forcing the cortège to proceed through the city. There are biographies by Clerici, 1907, and Lewis Melville, 1912.

Caroline Islands, scattered archipelago in the Pacific Ocean, included in Micronesia, between 5° and 10° N. and 135° and 165° E. The total land area is 380 sq. m. and total area 800 sq. m. Pop. about 40,000. They are divided into three groups, E., W., and Central. The chief is. are Ponape and Kusaie in the E. group, Yap in the W., Truk in the Central. The Pelew Is., of which Babeltop is the largest, are administered from Yap. The climate is healthy, but the is. are subject to severe storms and the rainfall is heavy. Among the chief products are copra, pearl and turtle shell, and bécho de mer. The natives, very mixed ethnologically, are excellent boat-builders and navigators and successful agriculturists. Yap is remarkable for its peculiar currency; in addition to the ordinary shell-money, huge limestone disks are used, from 6 in. to 12 ft. in diameter; these are brought from the Pelew Is., and are piled round the chief's treasure-house and apparently regarded as public property. The C. I. were discovered in 1537 by the Portuguese Diego da Rocha, who named them Sequelra Is.; in 1686 they were renamed by Adm. Francisco Lazearo in honour of Charles II. of Spain. In 1899 they were bought by Germany from Spain for 25,000,000 pesetas. In Ponape and Kusaie colossal stone structures exist, pointing to a prehistoric race well advanced in general culture. In the is. of Lélé the ruins appear like a citadel with basaltic ramparts; there are also numerous canals and apparently artificial harbours with high sea walls built in the water. The whole is. of Ponape is strewn

with basalt blocks of huge size put together without mortar, once having formed massive walls. The present Polynesian peoples could not have planned or executed these works, and they are attributed to a race of the new Stone Age, possibly coming from the Asiatic mainland. In 1919 the C. I. were assigned to Japan under the mandate of the League of Nations. Naval and seaplane bases were built among the is., which remained in Jap. hands until Sept. 1945 when they were surrendered to the United Nations. The naval base at the Ulithi atoll has since been dismantled. The is. were taken over by the U.S.A., July 1947. Pop. of the is. 31,000, principally Kanakas.

Caroline Matilda (1751-75), queen of Denmark and Norway, was the daughter of Frederick, Prince of Wales; in 1766 she married Christian VII., king of Denmark and Norway, and fell under the malign influence of the royal physician, Struensee (q.v.); he became her lover, and the open liaison roused the anger of the people, who did not believe in the mental incapacity of the king. When Struensee was arrested she shared his fate and made an attempt to shield him. He did not try to conceal their guilt, and on his execution she was divorced and sent to Celle, where she d., 1775. See Sir F. L. Wexall, *Life of Caroline Matilda, Queen of Denmark and Norway*, 1864; W. H. Wilkins, *A Queen of Tears*, 1904.

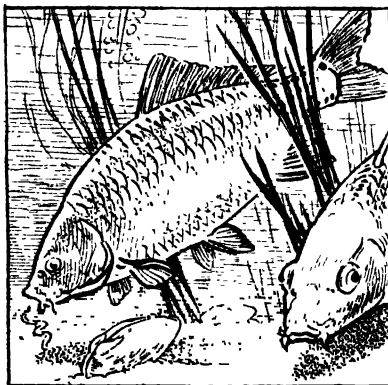
Caroline Wilhelmina (1683-1737), queen of George II., was the daughter of John Frederick, margrave of Brandenburg-Anspach. Five years after her father's death in 1687 her mother married Elector John George IV. of Saxony, and C. lived with her mother at Dresden. Left an orphan in 1696, the girl lived at Berlin with her guardians, Elector Frederick III. of Brandenburg and his wife, Sophia Charlotte, daughter of the Electress Sophia. Nine years later she married George Augustus, electoral prince of Hanover, by whom she had many children, the eldest being Frederick, afterwards Prince of Wales. See P. Quennell, *Caroline of England*, 1939.

Carolingians, see CARLOVINGIANS.

Carolus, Eng. gold coin, struck in the reign of Charles I. It was rated at £1, but appreciated in value to £1 3s. 9d. Its official title was unit, and it was also called a broad. 'C dollars,' Sp. coins of Charles III. and IV., were long current in the E., especially in China, containing eight reals; they were known as pieces of eight. They are still current in some of the tea-growing dists. of China, and as the people hoard them they have greatly exceeded their intrinsic value.

Carolus-Duran, name adopted by Charles Auguste Émile Durand (1837-1917), Fr. painter, b. at Lille, July 4. He first studied at the Lille Academy, and then went to Paris; in 1861 he travelled in Italy and Spain, where in particular he studied the style and technique of Velázquez. His first success was with a subject picture, *Murdered, or the Assassination*, which is now in the Lill Museum. Later he became a portrait-

painter. In 1869 a portrait of his wife, called 'The Lady with the Glove,' was bought for the Luxembourg. He was the head of one of the prin. studios in Paris; and some of the most celebrated artists of his day, including J. S. Sargent, were his pupils. He had extraordinary power of vivid realism, and his handling of surfaces was exquisite. In 1904 he was made a member of the Académie des Beaux Arts, and, 1905, director of the Fr. Academy at Rome.



CARP

Carolus Magnus, see CHARLEMAGNE.

Caronia, seaport on the N. coast of Sicily, in the prov. of Messina, 20 m. E. of Cefalu. Pop. 6000.

Carora, tn. of Venezuela, in the state of Lara, situated on the R. C. Rubber, leather, and hides are exported, and horse-raising is an industry. * Pop. 8000.

Carotid Arteries, two arteries which convey the blood supply to the head. They pass through the neck on either side of the windpipe, and each opposite the angle of the jaw divides into two, one branch serving the nose and eyes, and the other branch the brain. The pulsation in these arteries is easily felt from the surface.

Caroto, or **Carotto**, **Giovanni Francesco** (or **Gianfrancesco**) (c. 1480-1546), It. painter, b. at Verona; worked in Mantua under Mantegna, whose style he imitated. After returning to Verona he painted frescoes in the church of San Tommaso Cantuariense (Thomas à Becket). Among his best works are the frescoes in Sant' Eufemia, Verona, depicting scenes from the book of Tobit. One of his earlier works was a 'Virgin and child, with an infant John the Baptist' in the Gallery of Modena. According to Vasari he afterwards worked for the Visconti and Montferrat families. There are pictures by C. in many churches and galleries of Mantua and Verona, including his 'Glory of the Virgin' (signed and dated 1545) in Verona, where he d.

Carouge, tn. and suburb of Geneva, Switzerland. It became part of the canton of Geneva in 1815 previously belonging to Savoy. It is situated on the R. Arve. Pop. 7500.

Carp (*Cyprinus carpio*) belongs to the sub-order Ostariophysi of the order Teleostei. Originally it belonged to Asia, but it has been introduced into Europe and for sev. centuries has flourished in Britain. The fish, which is closely related to such well-known species as goldfish and minnows, often grows to a very large size, and may weigh as much as 50 lb.; examples have been known to attain a great age also, some living as long as 200 years. In colour they are brown above, light beneath, have a compressed body covered with large scales, a long dorsal fin and shorter anal fin, and round the mouth depend four barbels. The C. usually inhabits quiet lakes, ponds, or sluggish streams, and during winter hibernates in mud; it is capable of living for a considerable time out of water. Its food is either vegetable or animal. The female is very prolific and spawns on weeds in May or June. The Crucian or Prussian C., a native of Europe, has the technical name *Carassius vulgaris*, while *C. auratus*, or golden carp, is the goldfish (q.v.).

Carp, Petrache (1837-1919), Rumanian statesman, b. at Jassy. He was the leader of the Young Conservative or Janinist party, the Janinim being a literary society which he founded with Rosetti and Maiorescu and changed into a political association. The object of the party was to improve the condition of the peasantry, introduce a gold standard, and develop industries by means of foreign capital. He came into power in 1888, passed a Bill for the distribution of state lands, and succeeded in introducing a gold standard. He was, however, unable to retain office, and was succeeded, 1891, by L. Catargiu. He trans. some of Shakespeare's plays into Rumanian. In the Privy Council, from Aug. 3, 1914, he alone supported King Charles's desire to side with the Central Empires in the First World War.

Carpaccio, **Vittore** (c. 1450-1522), It. painter, b. at Venice, of an old Venetian family. Little is known about his life. He may be regarded as a forerunner of the finest Venetian masters. His chief works were painted between 1490 and 1519. He was certainly a pupil of Lazzaro Bastiani, rather than his master, as formerly held, and he may have travelled with Gentile Bellini to Constantinople. His greatest works are at Venice; the series of pictures in San Giorgio degli Schiavoni, brought so prominently to notice by Ruskin, was painted by order of the hospice of San Giorgio from 1502 to 1508. The 'Madonna and Child,' in the National Gallery, commonly attributed to C., may have been painted by members of his studio. See P. C. Molmenti and C. Ludwig, *Life and Works of Vittore Carpaccio*, trans. by R. H. Cust, 1907.

Carpathians, great mt. system in central Europe, extending from Bratislava to

Orsova, in crescent form, for 800 m. The Danube valley divides them from the Alps, and the March from Silesia and the Moravian mts. After forming the boundary between Hungary and Rumania, they turn S., cut by the Danube, which flows in a picturesque gorge between Bazias and Turnu-Severin. They then slope down to the Rumanian plain in beautiful wooded declivities, intersected by valleys of numerous rivs., fed by the high rainfall of the dist. For the purpose of classification the whole system may be divided into two great groups, the E. and W. C. The E. C. stretch from the mouth of the Nera to the source of the Theiss. The W. C., start at the Theiss, and terminate at Bratislava. The chief groups of mts. are 'Little C., Beskids, Central C., White Mts., Lomnitzer Spitze, Eisthaler Spitze, and the High Tatra group, including the highest peak in the C., Gerlsdorfer, 8737 ft. Few mts. reach or pass into the snow line. There are no glaciers but glacial lakes, Meerangen, are hidden away in the snow-bound recesses at an elevation of 6000 ft. The best known passes are Teregova, from Orsova to Temeswar; Vulkur, in the valley of the Schyl; Rottenthurm, in the S. Transylvanian Alps, in a gorge formed by the Alata; Turzburg, between Bucharest and Brasov; and Jablunka between Bratislava and Cracow. The C. form a watershed for the Baltic and the Black Seas, the most important rivs. rising there being the Danube, Vistula, Theiss, Maros, and Szanos. Besides having more mineral wealth than any other mt. system of Europe, the region of the C. is rich and fertile, and well wooded with oaks, beeches, evergreens, and firs. In the less civilised parts wild animals are found, including the wolf, bear, and lynx, and occasionally chamois and ibex. The lammergeier, or bearded vulture, is found here. Geologically there are four zones of the C.: (1) The outer zone lying towards Russia, of soft tertiary rock, containing salt and petroleum; (2) the sandstone zone, extending S.E. from the March; (3) the crystalline zone of Palaeozoic rocks; (4) the volcanic zone, containing no active volcanoes, but subordinate mts. of volcanic origin. Gold, silver, quicksilver, copper, and iron are the chief minerals obtained. *See* I. Phillimore, *In the Carpathians*, 1912.

Carpeaux, Jean Baptiste (1827-75), Fr. sculptor, b. at Valenciennes. His father was a mason, and during his early years the family was extremely poor. For two years he worked in a drawing school in Paris, and in 1854 entered the École des Beaux Arts. He was awarded the Grand Prix de Rome for his statue of 'Hector with his Child, Astyanax.' At Rome he felt the influence of Michelangelo, and became more vigorous in style and passionate in expression. He sent sev. works to Paris, which were exhibited in the Salon and gained medals. C. must be regarded as one of the influences which have helped to free modern sculpture from the weight of academic classicism. Among his chief works are 'La Palom-

bella' (1856); 'Neapolitan Fisherman' (1858); 'Girl with a Shell' (1869); 'Ugolino and his Children' (1863); and 'Statue of the Prince Imperial' (1866), after which he was made a chevalier of the Legion of Honour. In 1869 he executed one of the groups, 'Dancing,' for the opera house, which aroused much prejudice by its strong realism, vigour, and vitality. His last work, a fountain, is in the Avenue de l'Observatoire, Paris. Many of his drawings and studies are at Valenciennes.

Carpel, term applied in botany to the organ, possibly to be regarded as a transformed leaf, found in the centre of the flower, whose function it is to produce ovules. There may exist only one C. in the flower, and the gynaecium is then said to be monocarpellary, e.g. sweet pea and other legumes, but if more than one should be present it is polycarpellary; in any case the C. or Cs. are important parts of the female essential organ of the flower, and the aggregate number constitutes the gynaecium. When the Cs. of a polycarpellary pistil are united to one another the condition is syncarpous, e.g. primrose; when they are free from each other it is apocarpous, e.g. buttercup. The fusion of Cs. affects the way in which the ovules are placed within the ovary, e.g. those which are folded on themselves first, and then fused by their adjacent margins, bear ovules in the centre, when the placentation is said to be axile, e.g. bluebell. The placenta is a swollen cushion formed from the fused margins which are themselves called septa. The style is a prolongation of the upper part of the C., and the stigma is the terminal knob borne at the apex of the style.

Carpentaria, Gulf of, situated on the N. coast of Australia, between Capes Arnhem and York. The most important is. contained in it are Groote Eylandt and Wellesley Is., the largest of which is Mornington Is. It receives the Mitchell Flinders, Leichhardt, and Albert Rs. The coast is low and swampy. It was named in 1623 by Carstensz, after Pieter Carpenter, governor-general of the Dutch Indies.

Carpenter, Edward (1844-1929), Eng. author, b. at Brighton, son of Charles C., barrister and retired naval officer. On leaving school at Brighton he went to Trinity Hall, Cambridge; tenth wrangler in 1868. Took orders, and was curate to F. D. Maurice at St. Edward's. Becoming dissatisfied with his creed, renounced orders and became univ. extension lecturer on astronomy in Yorkshire mts. In 1883, took a cottage at Millthorpe, Derbyshire, worked in the fields, and grew his own fruit and vegetables. Wrote poetry: *Narcissus* (1873); and *Towards Democracy* (under the influence of Whitman) (1883) - and prose: *Civilisation, its Cause and Cure* (1889); *Love's Coming of Age* (1896); *Angels' Wings* (1898); *Art of Creation* (1904); *The Intermediate Sex* (1908); *My Days and Dreams* (autobiography) (1916). He visited Ceylon, and his *From Adam's Peak to Elephantia* (1892) extols the oriental peace of mind. His whole life was in fact a reaction

against Victorian conventions and respectability. *D.* at Guildford, June 28.

Carpenter, Lord George (1657-1732), Eng. general, entered the army, 1672. He served in Ireland and Flanders, and in Spain as quartermaster-general to Peterborough, 1705. He commanded the cavalry at Alinza, 1707, at which battle he was second in command. He joined the Hanoverian party, defeating the pretender at Preston, 1715. In return for his services he was made governor of Minorca and commander-in-chief of the forces in Scotland. He was created baron, 1719; M.P. for Westminster, 1722-1729. His grandson was created Viscount Carlingford and Tyrconnel in the Irish peerage, but the earldom became extinct in 1853. *See Life of Lord George Carpenter*, 1736.

Carpenter, John (c. 1370-1441), London's tn. clerk, 1417-38; and M.P. for the city in 1436 and 1439. Compiled the city's privileges in the *Liber Albus*. Left a bequest which formed part of the foundation of the City of London School. Was an executor of Dick Whittington's will.

Carpenter, John Alden, Amer. composer, b. Park Ridge, Illinois, Feb. 28, 1876. He studied under Amy Fay and Seeböck, and at Harvard under J. K. Paine. His first notable works were *Improving Songs for Children* (1907) and *Gitanjali*, a song-cycle of poems by Tagore. His first symphony, *Sermons in Stones*, was written in 1917. A ballet pantomime, *The Birthday of the Infanta* (after Oscar Wilde), was produced by the Chicago Opera Company in 1919, and *Skyscraper*, also a ballet, by the Metropolitan Opera Company of New York in 1926. For the Washington bi-centenary in 1932 he wrote *Song of Faith* for chorus and orchestra, and *Patterns* (piano and orchestra) was played by the Boston Symphony Orchestra in the same year. His symphonic poem, *Seadrift*, followed in 1933; concerto for violin and orchestra in 1938; and his symphony for the fiftieth anniversary of the Chicago Symphony Orchestra in 1940. In 1943 he wrote *Song of Freedom*. His work shows variety and skill in orchestration. Awarded the cross of the Fr. Legion of Honour (1921).

Carpenter, Dr. Lant (1780-1840), Unitarian minister and theological writer, b. at Kidderminster. He studied at the academy of Northampton (1797), and at Glasgow Univ. (1798-1801). He became an assistant master at a school in Birmingham, and subsequently librarian of the Liverpool Athenæum (1802-5), when he was chosen as Unitarian minister of a boarding-school in Exeter (1805-17). From 1817 to 1829 he held a similar position in a school at Bristol. He was drowned in Italy, off the coast of Leghorn. Dr. C. pub. numerous sermons and polemical tracts, and wrote *Unitarianism, the Doctrine of the Gospel* (1809); *Systematic Education* (2 vols.) (1815), etc. His *Memoirs* were ed. by his son, R. L. C., in 1842.

Carpenter, Mary (1807-77), Eng. philan-

thropist, b. at Exeter, daughter of Dr. Lant C., a Unitarian minister, and sister of Dr. W. B. C. She was educated in her father's boys' school at Bristol. Her interest in poor children was aroused by Dr. J. Tuckerman of Boston, and in 1835 she started a working and visiting society and later a ragged school with a night school in the poorest part of Bristol. The visit of the Hindu philanthropist, Ram-mohun Roy, 1833, aroused her sympathies with India, and the first of her journeys to the E. was taken, 1866, where she initiated sev. reforms for women and children. She wrote many books embodying her schemes for the education of destitute children and those on the border of a criminal or vagrant life. Her book *Juvenile Delinquents* was instrumental in the passing of the Youthful Offenders Act, 1854. She d. in Bristol. *See life by J. E. C.*, 1879.

Carpenter, William Benjamin (1813-85), Eng. naturalist, son of Dr. Lant C., b. at Exeter. He graduated M.D. at Edinburgh, 1839, was made F.R.S. in 1844; gold medallist of the Royal Society, 1861; and was Fullerian prof. of physiology at the Royal Institution from 1845, being a most popular and admirable lecturer. His works include *Principles of General and Comparative Physiology* (1839); *The Microscope and its Revelations* (1856). *Principles of Mental Physiology* (4th ed. 1876); He was registrar of the univ. of London, 1856-79.

Carpenter Bee (*Xylocopa*), so named from its habit of boring holes in dry timber and forming little cells in which to lay eggs. The partitions between the cells are made of the wood-stuff fastened together with saliva. *X. virginica*, a N. Amer. species, is as large as a humble bee.

Carpentier, Georges, Fr. boxer, was b. at Lens near Calais in 1894, and worked in a coal-pit as a boy. At a boxing academy in the tn. he attracted the attention of the proprietor, Francois Descamps. When fourteen, he won a fight against Salmon, one of the best-known boxers at 7 st. 2 lb. He won the championship of France in every weight and div. On July 16, 1914, he fought Gunboat Smith at Olympia, London, for the world's heavyweight white championship, and won it through the disqualification of Smith for a foul. His most sensational fight in England was with the heavyweight Joe Beckett on Dec. 4, 1919, for the championship of Europe, the Prince of Wales being present at the match. Only two blows were struck, Beckett being knocked out a few moments after the fight started. He fought Dempsey in New York, July 3, 1921, for the world's championship, and was thoroughly beaten in the fourth round. He served in the Fr. Air Force during the First World War, and again on the outbreak of war in 1939 until the fall of France in 1940. During the Ger. occupation of Paris, the restaurant business which C. was running before the war was requisitioned by the Gers., but on being asked by them to manage it on their behalf, he refused.

Carpentras, tn. 16 m. N.E. of Avignon by rail, in the dept. of Vaucluse, France, which as Carpentoracte of the Romans was flourishing before Caesar's invasion of Gaul. Its interesting buildings include a fourteenth-century loggia's palace, a third-century triumphal arch, anct. fortifications, an old cathedral, and an aqueduct of forty-eight arches. The chief manufs. are silk, chemicals, and earthenware. Pop. 11,800.

Carpentry may be defined as the art of working timber into various shapes with different varieties of tools, and combining the pieces to support a weight or sustain a pressure. The difference between C. and joinery (q.v.) is that the former is concerned with the essentials, the latter with the ornaments, of a building. In building, C. covers all carcassing work: roofs, floors, partitions, centering, shuttering, and shoring. In furniture, it provides the roughest types. Heavy work, ranging from case-making to bridge building, also comes within the sphere of C. The composition and resolution of mechanical forces form the principles of the science of C., and the skilled carpenter must have either a practical or theoretical knowledge of such laws. It is beyond the scope of this article to go into such principles, but some explanation may be given of the terms and general processes of C.

Any assemblage of pieces of timber connected together is called a frame. The points of meeting of the pieces of timber in a frame are termed joints, and one of the first requisites in C. is a knowledge of the various ways of joining pieces of timber so as to stand different strains and pressures. When one piece of timber is not long enough, it is joined to another piece in the same direction by various methods; this is called technically lengthening a beam. The roughest method of doing this is by fishing; the ends of the beams are placed together, and a piece of timber is placed on each side and secured by bolts passed through the whole. Another method is halving the beams so that they present a level face when joined together, and can be united by means of bolts. Scarf-joints are employed when it is necessary to maintain the same depth and width throughout the beam. In this method a part of the thickness of the timber is cut away from each beam; the parts cut away are on opposite sides, and correspond to each other, so that the beams will fit into each other, and can be bolted. Different varieties of scarf-joints are employed where the timber is subjected to compression, tension, or to a bending strain, etc. Hard-wood pieces called keys are inserted into the holes of a scarf-joint before the bolts in order to compress the beams closely together; they must not be driven in too hard or the fibres of the wood will be strained. In bolting together scarf-joints side plates of iron are used to protect the wood. Another mode of joining timber is by mortise and tenon, which is employed wherever one piece of timber meets another without crossing it.

A hole called a mortise is made in one piece of timber, and a projecting portion called a tenon is left on the other. The tenon is driven into the mortise and secured in position by glue, or by a pin penetrating it laterally through the side of the mortised beam, or by an external iron strap which passes round the beam and is riveted in the other, the beam which has the tenon. When the two pieces of timber do not meet each other at right angles, modifications of the mortise and tenon joint are adopted, so that a bearing surface may be provided which is at right angles to the direction of the thrust exercised by the entering timber. Other operations performed when timbers cross each other are notching, cogging, and housing; these joints must be strengthened by bolts or straps. When greater strength is required than a single beam will give, the processes of building and trussing beams are used. Building beams is combining two or more beams in depth so as to have the same effect as one large beam; the beam is cut in two and supported with cross-beams in the operation of trussing.

The framework by means of which the covering of a building is supported is known as the roof. The simplest form of roof consists of a series of pieces of timber with their own ends resting on the walls and their other ends meeting at a ridge-pole. These are called rafters, and their lower extremities are connected by a piece of timber called a tie, as otherwise this framework would thrust out the roof when loaded with the weight of the covering. The whole frame is known as a couple; such a simple form of roof, however, can only be used when the building is less than 20 ft. long. When the tie is longer than that, it is apt to sag in the middle, and a fourth piece, called a king-post, is added to unite it directly with the apex of the rafters. Cross-pieces, called struts, are added if the rafters are liable to sag; their centres are thus united to the centre of the tie. If the span is longer than about 30 ft. it is inadvisable to leave the rafters unsupported for half their length, and the following formation is substituted: The centre of each rafter is joined to the tie by a piece which falls perpendicularly on it; the rafters are also joined to each other by a piece which runs parallel and above the tie. The perpendiculars and the section of the tie enclosed by them thus form a parallelogram with the rafters. The horizontal piece is called a collar-beam, and the suspending pieces queen-posts. The whole frame is known as a truss; the trussed frames are placed at intervals of about 10 ft. They support horizontal pieces known as purlins, which run the whole length of the roof, and support the common rafters and their covering. All roofs, of whatever size, are founded on the above models, unless it is not desired that there should be a tie-beam, as in churches, etc. The walls are then made stronger or the roof principals are modified in shape to meet the greater horizontal pressure.

The framing of timber supporting the

floor of the room above and the ceiling of the room below is called the naked flooring; there are three main kinds of flooring—single, double, and framed. Single flooring consists of one series of joists which stretch right across from wall to wall without any support. The flooring boards are laid on the top of these joists, and to the under side is affixed the ceiling of the lower storey. Double flooring has a middle series of binding joists, resting on the walls in the same way as the joists of single flooring; above these joists are the bridging joists and below are the ceiling joists. Both these are notched into the main joists where they cross them, and support respectively the floor above and the ceiling below. Framed flooring has beams in addition to the binding, bridging, and ceiling joists; the binding joists do not cross the whole width of the room, but are framed into these beams at intervals. A double ceiling of lath and plaster is occasionally used to deaden sound; the most general method, however, is the insertion of plugging between the roof and the ceiling. Framed floors are used where there are large spans, double floors ensure evenness of floor and ceiling, and single floors give strength combined with lightness where the spans are not very great. If the span for a single floor exceeds 8 or 9 ft., the joists should be strutted together to prevent twisting. Rough wooden profiles of the cornices of a room are made, and afterwards lathed round and plastered. This process is known as cornice bracketing.

The frames of timber which are used to divide the upper storeys of a building into rooms are called partitions. When these are not required to bear any heavy weight, they are formed as follows: A piece of timber, called a sill, is laid along the floor, and a corresponding piece along the ceiling joists. The lath is nailed to the vertical pieces, known as quarters, with which the space between is occupied. If the partition has to support any weight it has to be trussed with posts and braces, and brickwork or concrete may be used to fill up the space. When a staircase is made of wood, the pieces of timber upon which it rests, and which form the framework, are known as the carriage. They are two in number, and are inclined at the angle which it is desired that the steps should have; they are called technically rough strings. A piece of timber, which projects horizontally from the upper level to which the staircase leads, forms the support for the rough strings and also for the joists of the landing; this is called a pitching or apron piece. When bridges or vaults are in course of construction, curved frames are needed to support the arch stones; these frames are known as centres. The ribs of which the centres are composed are built of a series of short timbers shaped to the curve required; they are placed about 6 ft. apart, and are connected by horizontal ties as well as by diagonal bracing. The centres serve to support the narrow boards which carry the stones of the arch. When the arch is properly keyed, the centres are struck

gradually so that the arch takes its proper bearing slowly. Staging is built up of two rows of standards, or large square timbers, resting on a sill of timber on the ground. Longitudinal beams at the top support a platform, on which a small railway may run. If the staging is large and required for a travelling crane, it is known as a gantry. Consult J. Wilson, *Wilson's Combined Works: Building Construction, Carpentry, and Joinery*, 1921, and *Carpentry and Joinery*, 1921; F. W. Lewis, *Home Carpentry and Cabinet-making*, 1921; C. Ellis, *Modern Practical Carpentry*, 1927; R. Greenhalgh, *Practical Joinery and Carpentry*, 1923, and *Joinery and Carpentry* (4 vols.), 1939-40.

Carpet (It. and Low Lat. *carpita*, a coarse cloth, from Lat. *carpere*, to pluck), heavy woven fabric, used as a covering on floors. They were first made and used in the E., where the custom of sitting cross-legged on the floor and of praying in a low, crouching position necessitated the use of some soft covering to the floor. When Cs. were first brought to England, they were used as a rich covering for beds and tables, straw, dried rushes, or sand being spread over the floors. When Cs. were first spread over floors they were regarded as a great luxury, and only in keeping with a lady's boudoir. Hand-woven tapestries were commonly made during the Middle Ages in convents and by ladies of rank, and were sometimes spread over the floors. The industry first developed in France, where a factory was estab. in 1607 at the Louvre by Henry IV. Other C. factories were estab. in Chaillot, 1627, and at Beauvais, 1661. In 1695, with the revocation of the edict of Nantes, most of the weavers—for the majority were Protestants—fled across the Channel, and thus the industry was started in England. The Flemish weavers first settled in Bristol, but the knowledge of the art soon spread to N. Eng., and notably to Kidderminster, Dewsbury, and Glasgow. The chief varieties of Cs. are the Brussels, Wilton, Persian, Turkey, Indian, Kidderminster, and Axminster. Like Cs., rugs came to us originally from the E., where the rug or C. is the most important, often indeed almost the only furnishing of the house. Indian, Persian, and Turkish Cs. and rugs are the best examples of the art.

General Principle of Manufacture.—The original method of C. making was by hand, and to this day Cs. are made both in Europe and in oriental countries in precisely the same manner as of old. The principle is very simple. The warp threads forming the chain are wound on two horizontal beams and the weavers sit side by side in front, the C. as it is woven being gradually wound on the lower beam and the warp correspondingly unwound from the upper beam. The yarn for the pile is cut into tufts and knotted by the weaver. The interlocking of warp and weft forms the weave of the C. Hand-weaving is slow, and therefore the product is very expensive. The first type of machine-made C. to be made in England was the Brussels C.

Brussels Carpet.—This C. is composed

of a mixture of linen and worsted, the cloth or reticulated part of the structure being entirely of linen, and the worsted only showing on the upper surface and making the pattern. Through the coarse linen fabric, worsted thread of different colours is drawn and held in loops over the wires. When the work is complete, the wires are removed and the remaining loops give a soft pile and make the figured surface of the C. Brussels Cs. were introduced into Kidderminster from Tournai in 1745.

Wilton Carpet or Velvet Pile.—This is made with longer loops, woven over sharp wires, which, when withdrawn, cut the worsted, leaving a full velvety pile, but otherwise is similar in manuf. to Brussels. The C. may afterwards be sheared to even the surface. In recent years, many Wilton looms have been erected capable of weaving seamless Cs. 12 ft. wide or more.

Persian Carpets.—This manuf. dates from very early times. They are thicker and softer than ordinary Cs., are of great durability, and are renowned for their beautiful designs. They are made by knotting woollen yarn on warp threads, the tufts thus formed being firmly held in place by the wool yarn. Old Persian Cs. are highly valued and are of great value.

Turkey Carpets.—These are somewhat similar to Persian Cs., being made in the same fashion, but their designs are stiffer and more geometrical in character. The colouring is very rich. The industry flourishes chiefly at Uskiah in Asia Minor; Cs. of the same kind were formerly made at Axminster (1755-1835), and are still made at Wilton.

Indian Carpets. like Persian, are woven by hand, the design being formed by knitting into the warp tufts of woollen threads of the proper colour one after the other. But modern Indian Cs. are much inferior to the earlier Indian pile Cs. in pattern owing to the debasing influence of W. designs.

Kidderminster Carpet.—This is made in the greatest quantities in Scotland and Yorkshire, and is the oldest kind of machine-made C. It is made by the intersection of two or more cloths of different colours, woven in stripes of different shades. They are made in layers, and are called accordingly two-ply or three-ply. The back of the C. is exactly the same pattern as the face-side, but the colours are reversed. There is no pile, the yarn lying flat on the surface, as in worsted cloth.

Axminster Carpet.—It was first made in England by Thomas Whitley in 1755. It is usually made to order, being made in one piece according to the dimensions of the room for which it is required. They resemble Turkey Cs., and are made in tufts of coloured worsted or woollen tied under the warp, the linen threads being rammed down and concealed. As is the case with Turkey Cs., the difficulty lies in changing the colours so as to form the required pattern. In 1839 Mr. Templeton of Glasgow patented a method of making

Chenille Axminsters. The chenille is woven on a separate loom, cut into strips, and bound into tufts, and is then woven into the C., being used as the weft thread. The process of weaving the fur into the C. is performed on a setting loom. Chenille Cs. are very popular, partly on account of the variety of colours which can be used, and partly owing to the comparative cheapness. *Royal Axminsters* do not require the chenille to be woven separately; the tufts are cut by machinery and are threaded into the C. by the linen weft. The later types of loom for weaving the fabric can produce a C. 5 yds. wide without a seam.

Seats of Manufacture.—Brussels and velvet-pile Cs. are largely made at Kidderminster, and also at Durham and Halifax. Kidderminster Cs. come from Kilmarnock and Bannockburn in Scotland, and from Dewsbury and other places in Yorkshire. Only a small quantity is made in Kidderminster itself. The finest Persian Cs. are made at Kurdistan. The patent chenille Axminsters are made to a large extent in Glasgow. In the U.S.A., Cs. are chiefly manufactured in Philadelphia, where the first factory was estab. in 1791, and in Lowell. The most famous Fr. Cs. are the Savonnerie, made in Paris, and the Aubusson Cs. See R. S. Brinton, *Carpets*, 1919; A. F. Kendrick and C. H. C. Tattersall, *Hand-woven Carpets, Oriental and European*, 1922; A. Hackwell, *Die Chinesische Teppiche*, 1921; R. Beaumont, *Carpets and Rugs*, 1924; F. J. Mayers, *Carpet Designs and Designing*, 1931.

Carpet-bagger, slang political term for a candidate who stands for election in a locality to which he is a stranger. The term was used contemptuously after the Civil war in the U.S.A., for the N. politicians, who, by the help of the Negro vote, controlled the S. administration.

Carpet Bedding, in gardening, the name of a certain formal arrangement of beds, adorned chiefly with bright-coloured foliage-plants, or low-growing flowering ones, such as lobelia, cerastium, anubria, colons, sedum, thrift, echeverius, saxifrage, or box, so arranged as to resemble a figured carpet. The patterns are usually geometrical designs, but sometimes birds, butterflies, or other objects are represented. This style is not so popular at present as it was some fifty years ago, owing to its extreme formality (cf. Dutch gardens with clipped box or yew trees). The soil is banked up for the dwarf plants to bring them to the same level as the taller growers, and present an even surface throughout.

Carpi: 1. Com. and tn. in the prov. of Modena, Emilia, Italy. 9 m. N.N.E. of Modena. It has a castle, two cathedrals, and a fine Renaissance church of the fifteenth century, also the bishop's palace. Silk industries thrive. Pop. (com.) 31,000. 2. Vil. on R. Adige, 28 m. from Verona, where Prince Eugène defeated the Fr. in 1701.

Carpi, Ugo da (1450-1523), It. painter and engraver, claimed to have discovered the art of chiaroscuro printing, but Ger.

research would seem to have proved that the art was practised in Germany in 1499 or before, whereas the earliest of C.'s prints is dated 1518. C. used three blocks in his famous engravings after Raphael.

Carpineto, tn. in the prov. of Rome, Italy, 37 m. from the city of Rome. Bp. of Pope Leo XIII. (1810-1903). The windows and the rose window of the church of Santa Maria del Popolo were damaged in the Second World War. Pop. 5000.

Carpini, Joannes de Plano (c. 1182-1252), b. in Umbria, W. Italy, was a Franciscan traveller. Was a companion and disciple of St. Francis of Assisi. He was sent to China by Pope Innocent IV. at the head of an embassy to negotiate with the Mogul powers, and to use his diplomacy to turn them from their avowed intention of devastating Europe. He set out from Lyons in April of 1245, and returned in 1247. Soon after C. was rewarded by the pope with the bishopric of Antivari in Dalmatia, but it is probable that he did not long survive the hardships of his remarkable journey. He had a genius for recounting his adventures, and Hakluyt pub. portions of his original work; complete text first pub. 1839 as vol. iv. of the *Recueil de voyages et de Memoires of the Geographical Society of Paris*. Ed. for Hakluyt Society by C. R. Beazley, 1913.

Carpino, tn. of Italy in the prov. of Foggia, 22 m. N.E. of San Severo. Pop. 6000.

Carpinus, see HORNBEAM.

Carpobalsamum, name given both to the dried fruit and to the oil obtained from the fruit of *Commiphora opobalsamum*, a species of Burseraceae which yields balm of Gilead. The oil is aromatic and volatile, and should be used while fresh or it becomes inert.

Carpocrates, or **Carpocras** (Καρποκράτης, or Κάρποκρας), Alexandrian gnostic philosopher, probably of Hadrian's reign (A.D. 117-38), who fl. in the second century and founded the sect of Carpocratians, who existed as late as the sixth century. They were avowed eclectics, taught that Christ was a human being of pre-eminent goodness, and that the world was created by angels. The Supreme Deity was the Monas. They believed in pre-existence of the soul, and worshipped Zoroaster, Pythagoras, Plato, and others, as well as Christ, as benefactors of mankind.

Carpology (Gk. καρπός, fruit, λόγος, word), the name given to the div. of botany which comprehends all that relates to the structure of the fruit.

Carpophore (Gk. καρπός, flower, φέρειν, to bear), botanical term used to indicate the prolonged axis of a flower which passes up between the carpels to the top, and which serves to attach the carpels to the plant when they have split apart, e.g. in a silique. Examples occur in the Umbelliferae, Geraniaceae, and Rosaceae.

Carpus (Gk. καρπός, wrist), in anatomy, the series of bones between the forearm and hand. In man there are eight small bones in two irregular rows of four. The

upper row articulates with the radius, the lower with the metacarpal bones of the hand. Rudiments of carpal bones are found in all mammals.

Carpzov, **Benedikt** (1595-1666), Ger. jurisconsult, son of B. C. (d. 1624). Privy Counsellor to the elector of Saxony, and author of *Practica nova Imperialis Saxonica rerum criminalium* (1635); *Definitiones forenses* (1668); and other works.

Carr, **Herbert William** (1857-1931), Eng. philosophical writer. Educated at King's College, London Univ., and became prof. of philosophy there. Publications: *The Problem of Truth* (1912); *Henri Bergson* (1912); *The Principle of Relativity* (1920); *Gentile's Theory of Mind as Pure Act* (1921); *The Scientific Approach to Philosophy* (1924); *Changing Backwards in Religion and Ethics* (1927).

Carr, **John** (1721-1807), Eng. architect, called C. of York, b. at Horbury, near Wakefield. He made his reputation as an architect of the Palladian school. The court-house, castle, and jail at York, Newark tn. hall, and the par. church of Horbury, were all built according to his designs. Though of humble origin, he was twice mayor of York, and d. leaving £150,000.

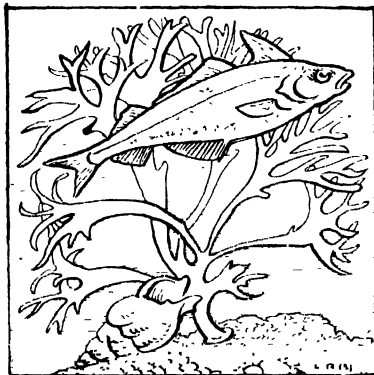
Carr, **Joseph William Comyns** (1849-1916), Eng. art critic and dramatist; educated at London Univ. He was one of the editors of the *Academy*. He became Eng. editor of *L'Art*, 1875. He was director and one of the founders of the New Gallery, Regent Street, where many of Burne-Jones's works were first exhibited. Among his publs. are *Drawings by the Old Masters* (1877); *Examples of Contemporary Art* (1878); *Essays on Art* (1879); *Papers on Art* (1883-84); and *Modern Landscape*. C. also wrote *A Fireside Hamlet*; *The United Pair*; *Forgiveness*; *King Arthur*; *Some Eminent Victorians*; and adapted various novels for the stage.

Carr, or **Ker**, **Robert**, Earl of Somerset (d. 1645), Scottish politician, favourite of James I. of England. In 1603 he accompanied James to England as page. In 1604 C. broke his arm in a tilting match before the king. His appearance pleased James, who substituted a favourite for a constitutional adviser, and loaded him with honours. Knighted 1607; Viscount Rochester, 1611; earl of Somerset, 1613. C. married Lady Essex, after procuring her divorce from her first husband. His influence now began to wane before that of Villiers. In 1615 he was implicated in his wife's poisoning of Sir Thomas Overbury (1613). Bacon conducted the prosecution as attorney-general; both earl and countess were condemned to death, but received the royal pardon. See A. Amos, *The Great Oyer of Poisoning*, 1846; S. R. Gardiner, *History of England*, 1885-1900.

Carracci, see CARACCI.

Carrageen Moss, otherwise known as **Irish** or **Sea Moss**, edible seaweed technically called *Chondrus crispus*, found on rocky shores of N. Europe and N. America. It is reddish-brown in colour, 2 to 12 in.

long and repeatedly forked. After it has been collected it is bleached in the sun and dried, when it is ready to be sold. When boiled in fresh water or milk it yields a pleasant drink, or can be made into jelly. It is also used for making size, stuffing mattresses, and feeding cattle.



CARRAGEEN MOSS

Carranza, Bartolomé (de Miranda) (1503-76), Sp. priest, b. in Navarre. He entered the Dominican order, and became prof. of theology at Valladolid. Charles V. sent him to the Council of Trent, 1546, and he also sat in that of 1551. He accompanied Philip II. to England, and became Queen Mary's confessor, working zealously to establish Catholicism. Chosen archbishop of Toledo in 1557, he was accused of heresy by the Inquisition, nominally owing to his *Comentarios sobre el Catechismo Christiano* (1558), and spent the rest of his life in prison.

Carranza, Emilio (1905-28), Mexican airman, descendant of Venustiano C., president of Mexico. Served in the operations against Yaqui Indians and in warfare against rebels. Regarded as the most intrepid airman of his country, his best flight being from San Diego to Mexico City, a distance of nearly 1600 m. accomplished in 18½ hrs. Killed in an accident in New Jersey while attempting a non-stop flight from Long Is. to Mexico City. Won great popularity in U.S.A. by his 'beau geste' flight, shortly before his death, from Mexico City to Washington.

Carranza, Venustiano (1859-1920), president of Mexico, b. in Cuatro Ciénegas, in the state of Coahuila, and educated in Mexico City. In early life he cultivated his extensive farms in Coahuila. He made sev. attempts to enter Parliament, but was defeated through the efforts of President Díaz. In 1911, he sided with the revolutionary president Madero—to whom, however, he was not believed to be loyal. He was, under Madero, elected governor of Coahuila. When, after the murder of Madero, the presidency was seized by Huerta, in 1913, C. declared war

against Huerta. In Aug. 1914 C. obtained the surrender of the administration; and in Oct. 1915 was recognised as president by the U.S.A. He was not formally elected, however, until the end of 1916. Another revolution broke out in 1920; C. was defeated, and was captured on May 16, and, five days afterwards, while sleeping in a badly guarded hut near Tlaxcala-Tonga in the state of Puebla, he was shot dead.

Carrara, tn. in W. Italy, on the Avenza, famous for its marble quarries, which have been worked for over 2000 years. The supply seems inexhaustible, though much has been wasted by the use of primitive machinery, 500,000 tons being quarried to produce 150,000 tons exported. The marble used for sculpture is peculiarly white and flawless and of great durability, but few of the numerous quarries produce this variety. Nearly all the surrounding heights are of marble, and mt. railways are taken half-way up the mt. side to serve the quarries. The tn. contains many fine marble churches and an academy for sculpture, founded by Napoleon C. is quite near to the site of anc. Luna, a celebrated Etrurian city. Pop 24,000.

Carrel, Alexis (1873-1944), Fr. doctor of medicine, b. at Sainte Foy-les-Lyon, France, June 28. After studying medicine for a time when quite a youth and becoming a member of the Lyons Univ., went to the U.S.A., where he became connected with the Univ. of Chicago. In 1909 he was elected an associate member of the Rockefeller Institute for Medical Research. In 1912 he was awarded the Nobel prize (amounting to £7800) for medicine on account of his brilliant success in suturing of blood vessels and in transplantation of human organs. He conducted some remarkable experiments in 1913 on cats, keeping vital organs alive for some hours after their removal from the body. At the outbreak of war, he returned to France, and became famous as the chief inventor of the C.-Dakin treatment of wounds by irrigation—every part of the wound being repeatedly sterilised with a solution chiefly of hypochloride of sodium, applied through a system of rubber tubes. In 1919 he returned to the Rockefeller Institute and continued his work there until his retirement in 1939. In the following year he returned to France, and was placed by the Vichy Gov. in charge of the Foundation for the Study of Human Relations, where he remained until the liberation of France in 1944. Charges made against him of collaboration with the Gers. were denied. There was no trial and C. d. the same year or Nov. 5. See Sir Wm. Macpherson (ed.), *Official Medical History of the War* (1921-24).

Carrel, Nicolas Armand (1800-36), Fr. journalist and publicist. He was for a time secretary to the historian Thierry. In 1828 he pub. *Résumé de l'histoire de la Grèce moderne, Résumé de l'histoire d'Écosse*, and *Histoire de la contre-révolution d'Angleterre*. In 1830 C. founded the *organ of Liberal opposition*, becoming chief editor. He spoke fearlessly against

the gov., and uttered an indignant protest at the execution of Marshal Ney. Though moderator, as well as leader, of the popular party, he was imprisoned by Louis Philippe's gov. for his writings. He was killed in a duel by the editor of the *Presse*. A statue was erected to him, 1887, at Rouen. C.'s *Œuvres politiques et littéraires* (5 vols.) were ed. by Littré and Paulin, 1857-58.

Carrer, Luigi (1801-50), It. lyric poet and scholar, native of Venice. He gave up the law for literature, becoming prof. of philosophy at Padua, 1830; later, director of the Correr Museum, Venice. His poems included idylls, epigrams, sonnets, hymns, and tragedies, but the best are ballads (introduced from Germany) and odes. His *L'anello di sette gemme* (1838) told in poetical form the hist. and customs of Venice. Vols. of poems and ballads appeared in 1832, 1838, and 1841; prose and poetry, 1837; and odes and sonnets in 1868. See lives by Veludo, 1851; Venanzio, 1855; and Sartorio, *L. Carrer*, 1900.

Carrhe, anct. city of Mesopotamia, about 25 m. from Edessa, the Haran of the Bible and Assyrian inscriptions. The crushing defeat of Crassus by the Parthians in 53 B.C., when the Rom. standards were lost, is frequently mentioned in classical literature.

Carriacou, is. of the Brit. W. Indies and the largest of the Grenadines, being 8 m. long, and from 2 to 4½ m. wide. Cotton is grown. Hillsborough, on the W. coast, is the tn. and harbour. Pop. 3000.

Carriage (Lat. *carrus*, car, chariot, wagon), a means of carrying; any vehicle intended to convey goods, but especially passengers, by road or rail. Hence, railway C., hackney C., gun C., and various other compounds. Cs. are structures on two or more wheels, and vary greatly in size and shape. Possibly they were first developed from the Egyptian sledges and rollers used for conveying heavy loads. Chariots were known also to the anct. Israelites, Gks., and Rom., chariot racing being a favourite sport at the public games of Greece and Rome. The covered C. of to-day dates from about the fifteenth century. In 1555 the first Eng. C. (excluding the war-chariots of the anct. Britons) was made by Ripon for the earl of Rutland. By the seventeenth century they were much used, and ousted the sedan-chair, being themselves replaced by the cab in 1820. The hansom cab was introduced in London in 1834 by Joseph Hansom. Other two-wheeled Cs. are the stanhope, tilbury, gig, and dog-cart. In the eighteenth century many improvements were made, the body was suspended on straps, attached later to 'C'-shaped springs. The use of the private four-wheeled C. drawn by one or more horses (often the 'C. and pair,' with two horses) was especially marked during the Victorian era. The brougham was introduced in 1839, other types being the landau, victoria, and four-in-hand. Open four-wheeled Cs. are the phaeton,

wagonette, and brake. The drag and the omnibus have seats both outside and in. Cs. have various different special names in different parts of the world, but the word is commonly used in England of the four-wheeled, private, horse-drawn vehicle. See also CAB; CART; COACH and COACHING. See H. McCausland, *The English Carriage*, 1948.

Carriage-building, see COACH-BUILDING.

Carriage Dog, see DALMATIAN DOG.

Carriage Licences. The rates for local taxation licences in respect of Cs., motors, or mechanically propelled vehicles are as follows: for horse-drawn or mule-drawn Cs. with four or more wheels, £2 2s. if to be drawn by two or more horses, £1 1s. if by one horse only; Cs. with less than four wheels and hackney Cs. 15s. The rates for motor cars are graduated according to the h.p. of the car, and range from £6 for a car not exceeding 6 h.p. with £1 5s. additional for every unit of h.p. Higher rates were imposed in 1939 on cars over 15 h.p. £10 is the duty for a hackney motor having a seating capacity for not more than four persons; £12 where the seating capacity is more than four but not more than eight; £24 when the seating capacity is not more than fourteen and the vehicle is fitted entirely with pneumatic tyres, and £30 for other vehicles; and so on, up to £96 for a vehicle seating sixty-four persons, if entirely fitted with pneumatic tyres, and for other vehicles £120; with an additional £1 5s. and £1 10s. respectively for each person in excess of sixty-four (excluding the driver in every case).

Carrick, The, one of the three divs. of Ayrshire, Scotland. The earl of C. is the Prince of Wales's title as steward of Scotland.

Carrick, Thomas Heathfield (1802-75), Eng. miniaturist, b. near Carlisle, educated at the grammar school there; a self-taught artist. He neglected his chemist's business for painting. In 1836 he moved to Newcastle; 1839 to London. From 1841 to 1866 exhibited annually eight miniatures. Among the most famous are those of Carlyle, Sir R. Peel, Rogers, Wordsworth, Longfellow, Charles Keen, Farren, Macready, Daniel O'Connell, and Robert Owen. In 1845 awarded a medal for his invention of painting miniatures on marble; awarded a Turner annuity by Royal Academy about 1868. See Royal Academy catalogues (1841-66).

Carrickfergus, seaport tn. in co. Antrim, N. Ireland, is situated on Belfast Lough. William III. landed here just before the battle of the Boyne. The castle of C., dating back to the twelfth century, is still used as a fortress. Flax spinning and oyster fishery are the chief industries. Pop. of tn. 4600.

Carrickmacross, mrkt. tn. of Eire, in the co. of Monaghan, with manufs. of leather and boots, and a trade in grain. Pop. 2100.

Carrick-on-Shannon, riv. port and mrkt. tn. of Eire, situated on the Shannon in the co. of Leitrim, 37 m. S.E. of Sligo. There is trade in shipping, dairy produce, and corn. Pop. 1000.

Carrick-on-Suir, tn. in co. Tipperary, Eire, connected with Carrickbeg, in Waterford, by a bridge over the Suir. It has an anct. castle and par. church. Woollen manuf. is the chief industry. Pop. 5000.

Carrier, Common, in Eng. law, one who undertakes for hire to carry goods or passengers from one place to another either by land or water. He is distinguished from the private C. by being ready to accommodate the public generally and has different responsibilities in law. Examples of land Cs. are omnibus companies, railway companies, wagoners, firms such as Carter Paterson & Pickford and others; Cs. by water are owners of steamships, ferry-boats, and the like. Up to 1933 the carriage of goods by road was uncontrolled and the Road and Rail Traffic Act of that year was passed as a result of a widespread feeling that the fierce and cut-throat competition in the industry which developed during the years following the First World War was becoming dangerous. This Act (which took effect as from 1934) imposed a measure of control by making it necessary for any person carrying goods for hire or reward to have a licence to do so, and to operate subject to specified conditions and in certain cases within defined limits. Since 1934 no person may use a goods vehicle on a road for the carriage of goods for hire or reward or for or in connection with any trade or business carried on by him except under a licence. Licences are of three classes (see *under* TRANSPORT ACT, 1947). The 'A' licence applies to the C. or public carrier and it entitles the holder to use his vehicle for the carriage of goods for hire or reward, but not for the carriage of goods in connection with any trade or business carried on by him except that of a carrier of goods. It is a condition of the licence that the vehicles are maintained in a fit and serviceable condition; speed limits and regulations as to loading are complied with; requirements as to drivers' hours are observed; and that records of work, journeys, and loads are kept (Sect. 8 (1)). Under the Transport Act, 1947, it shall be a condition of every licence that, except under a permit granted by the Brit. Transport Commission, goods shall not be carried for hire or reward in any authorised vehicle if the vehicle, at any time while the goods are being so carried, is more than 25 m. from its operating centre, and the Road and Rail Traffic Act, 1933, shall have effect as if the said condition were included among the conditions specified in subsection 1 of section 8 of the Act. But this additional condition is not applicable where the goods carried are liquids carried in bulk in a tank permanently fixed to the vehicle, or in a tank not so fixed of which the capacity is not less than 500 gallons, or are goods of a special character which under any statutory provision may only be carried in a specially constructed vehicle, or where the carriage is an ordinary furniture removal, or the goods carried are meat or livestock;

or the goods consist of felled timber carried in a specially constructed carriage. The general effect of this clause (52 of the Act of 1947) is that goods vehicles used under licence are not allowed to carry goods for reward more than 25 m. (measured as air miles) from their base, and that this becomes an additional condition of the licence.

A C. of goods must transport any except specially dangerous articles to the place to which he professes to carry goods. A fixed rate of payment must be charged to all employers alike, payment being made beforehand if desired. Otherwise the C. has a lien on the goods taken for his charges. He is in the eyes of the law responsible for all acts of his employees. Also, unless his liability be limited by a special contract, he is responsible for all goods entrusted to him until they have been delivered, and must make good any loss or damage occurring through any cause except 'the act of God, or the public enemy' (in the narrowest signification). These stringent rules exist to guard the interests of employers, and prevent their being entirely at the mercy of the C. If goods are to be warehoused with Cs. for a time previous to carriage, extraordinary liability is not incurred by them until the actual time of carriage, though of course ordinary care and precautions must be taken. In England if a number of Cs. are engaged in the transfer of goods, the first is held liable, as insurer, as being the party with whom the contract was originally made. Personal delivery is expected of land Cs. Water Cs. can only take goods to the wharf, but notice must be given of the vessel's arrival and discharge of cargo. A special contract may be entered upon for the carriage of goods, but no C. can exempt himself from liability for goods not mentioned in the Carriers Act by a mere printed notice that he refuses to hold himself responsible. A definite contract signed by the employer is essential before the C. can shake off his responsibilities as insurer. The Carriers Act of 1830 granted certain exemptions from liability to C. Cs. by land. A ship owner's liabilities are much the same, except as limited by the Merchant Shipping Acts, and by the contract of affreightment. At common law railways are C. Cs. only of such goods as they profess to carry. But as regards other goods, etc., their liability for neglect or default is dealt with by the Railway and Canal Traffic Act, 1851, and amending Acts. A railway is a C. of a passenger's personal luggage and therefore an insurer of its safety; but this is not so if the luggage has been taken by the passenger out of the control of the railway. Hence, in the event of accidents the railway is only liable if negligence can be proved. By the Railway and Canal Traffic Act of 1851 liability as to animals was limited. Railways are not C. Cs. of the passengers they carry and therefore are not 'insurers' of their safety. Passenger Cs. are not responsible for mishaps caused by the passenger's contributory negligence. They must accept as passengers all who comply with their

rules (as to tickets, use of cars, etc), except people of disorderly behaviour or those who have some contagious disease. See R. Temperley, *Carriage of Goods by Sea Act*, 1924, 1925; H. W. Disney, *Law of Carriage by Railway* (8th ed.), 1929; W. H. Gunn, *Law of Inland Transport*, 1932.

American Railways.—There is a vital difference in the Amer. law as to C. Os., railways being considered C. Os. of passengers, with the consequence that they are sued almost every day for accidents in which passengers are injured.

Carrier (Disease Carrier), person who, recovered from an infectious disease, retains the germ for various periods of time and is, therefore, capable of spreading the infection; notably in the case of typhoid, paratyphoid, cholera and dysentery, diphtheria, scarlet fever, and meningitis. The germs are carried in the feces, urine, throat, tonsils, and nose.

Carrier, Jean Baptiste (1756-94), Fr. revolutionist, b. at Yvetot. Elected to the Convention, 1792, he helped to form the Revolutionary Tribunal, voted for the death of the king, demanded the arrest of the duke of Orleans, and assisted in overthrowing the Girondists. C. was sent to Nantes, 1793, to repress the civil war started by priests and Royalists in la Vendée. He massacred over 16,000 Vendean and other prisoners without trial, sparing neither women nor children. Many were crowded into boats and sunk in the R. Loire ('Republican baptism'); others were shot down or guillotined. After Robespierre's fall, justice was demanded against this fiendish Jacobin, and after trial by the Paris tribunal he was guillotined.

Carrière, Eugène Anatole (1849-1906), Fr. genre-painter, b. at Gournay-sur-Marne, lived at Paris. Pupil of Cabanel; medal, third class, 1885. Called by Edmond de Goncourt 'the modern Madonna painter,' for his frequent treatment of maternity. Among his works are 'The Nymph Echo' (1880); 'Kiss of Innocence' (1882); 'Two Friends'; 'Marguerite' (1884); 'Sick Infant' (at Montargis); 'The Favourite' (1885); 'Théâtre de Belleville'; 'Christ on the Cross' (1897); 'Young Mother' (1897) (at Avignon). His famous 'Maternity' (1892), is in the Luxembourg, Paris. His portraits of Daudet, Edmond de Goncourt, Anatole France, Metchnikov, and others are also remarkably good. There is a decorative panel at the Sorbonne by C., (1898), and in the Hôtel de Ville, Paris.

Carrière, Moritz (1817-95), Ger. philosopher and writer on aesthetics; studied at Glessen, Göttingen, Berlin, and in Italy; 1849 prof. of philosophy at Glessen; secretary and prof. of ant. hist. at the Academy of Plastic Arts at Munich, 1853. At first a Hegelian, he later followed the system of Fichte more closely. He also ranked high as an art critic. Among his works are a treatise, *Aristotle the Friend of Plato* (in Lat.) (1837); *Die Religion in ihrem Begriff* (1841); *Die philosophische Weltanschauung der Reformationszeit* (1847); *Die letzte Nacht der Girondisten*

(a poem) (1849); *Das Wesen und die Formen der Poesie* (1854); *Ästhetik* (1859); *Die Kunst in Zusammenhang der Kultur-entwicklung* (1887); *Lebenserinnerungen* (ed. W. Djeih) (1914). See *Gesammelte Werke* (14 vols.), 1886-94.

Carrier Pigeon, variety of the family Columbidae, remarkable for the huge white wattle round the eyes and at the base of the beak. It is essentially a fancy bird, and the messenger pigeon proper is called the homer.

Carrington, settlement of New S. Wales, co. Gloucester, suburb of and 25 m. from Newcastle, New S. Wales. Large foundry and engineering works. Pop. 3000.

Carrington, Charles Robert Wynn-Carrington, see LINCOLNSHIRE, EARL OF.

Carrington, Sir Frederick, Major-General (1844-1913), Eng. soldier, educated at Cheltenham College, entered the army in the 24th Regiment, 1864. He commanded the Light Horse in the Transkei war, 1877; led the colonial forces against the Sekukuni in the Transvaal, 1878-79; and in the Basuto war, 1881. Commanded the native levies in the Zulu rebellion, and was commandant of Bechuanaland police, 1893; becoming also military adviser to the high commissioner in the Matabele war. K.C.B., 1897. In the S. African war (1899-1902) he commanded the Rhodesian field force, helping with Mahon to raise the siege of Mafeking, 1900.

Carrington, Henry Beebe (1824-1912), Amer. soldier and military historian, b. in Connecticut, graduated at Yale, 1845, studied law at Yale Law School, 1847. In 1869 prof. of military science in Wabash College. Among his many works are *Russia as a Nation* (1849); *History of the Battles of the American Revolution* (1876); *The Washington Obelisk and its Voices* (1887).

Carrington, Richard Christopher (1826-1875), Eng. astronomer, educated at Cambridge; from 1849 to 1852 observer at Durham Univ. After 1852 he conducted various private observations (especially of the minor planets, fixed stars, and the sun), mostly at his private observatory at Redhill, near Reigate, Surrey. Secretary of Royal Astronomical Society, 1857-62; F.R.S. 1860. He pub. *Catalogue of 3735 Circumpolar Stars* (1857) and *Observations of the Spots on the Sun* (1863), which greatly influenced the study of solar physics.

Carrion Crow (*Corvus Corone*), Brit. species of Corvidae, closely connected with *C. Corax*, the hooded crow. In S. America and the U.S.A. the name is given to *Catharista atrata*, the black vulture, a species of Cathartidae which greatly resembles the turkey-buzzard. The colour of this bird is black, and its naked head is also dark of hue. Both species act as scavengers, but the former will also attack young living animals.

Carrion Flowers are those which attract short-tongued flies by means of their meat-like appearance or their foetid smell and so become pollinated. Two such species are *Amorphophallus Titanum*

and *Arum maculatum*, both belonging to the order Araceae. They both emit a very disagreeable odour, and the former is of a red and yellow colour, which serves as an additional attraction. The genus *Stapelia*, which belongs to the Asclepiadaceae, has the same property to induce flies to fertilise its flowers, and the flowers themselves are of a dark red colour.

Carroccio, large war-chariot drawn by oxen, used by the medieval republics of Italy to carry their banner into battle. On a rectangular platform, painted red, were set the city's standard and an altar, at which the priests held services before battle. It was surrounded by the bravest soldiers in the army, was regarded both as a rallying point and as the palladium of the city's honour. Its capture was considered the deepest humiliation. First used by the Milanese in 1033, it later played a large part in the wars of the Lombard league against Emperor Frederick Barbarossa. The Milan C. was lost in the battle of Corte Nuova, 1237. The first Florentine one appeared in battle 1228.

Carroll, Charles, of Carrollton (1737-1832), Amer. patriot, b. in Maryland; educated at Jesuit colleges of Saint-Omer, Rheims, and Louis le Grand; studied law in Paris and London. He returned to America, 1764, inheriting a large estate. In 1775 member of the Committee of Observation and elected delegate to the Provincial Convention. In 1776 C. was sent to persuade the Canadians to war against England, and was delegate to Congress. He was the last surviving signer of the Declaration of Independence. In 1789 U.S.A. senator for Maryland; 1799, member of the Maryland and Virginia boundary commission. In 1810 he retired from public life. See life by K. M. Rowland, 1898; and L. A. Leonard, *Life of Charles Carroll of Carrollton*, 1918.

Carroll, John (1735-1817), Amer. Rom. Catholic prelate, cousin of above, b. in Prince George's co., Maryland; educated in Flanders; joined Society of Jesus in 1753; became a priest in 1769 and a professed father in 1771. He returned to Maryland in 1774, and took a prominent part in Amer. politics. Estab. and endowed through his influence Georgetown Univ. (completed 1791). He was consecrated a bishop in 1790, and became archbishop in 1811; as a staunch Federalist he opposed the war of 1812. He was the greatest Rom. Catholic priest in the U.S.A. in his time.

Carroll, Lewis, pen-name of Charles Lutwidge Dodgson (1832-98), Eng. mathematician and author, b. in Cheshire, educated at Rugby and Oxford. He took a first in mathematics, 1854; took orders, 1861; and was mathematical lecturer at Christ Church, 1855-81. He lived a retired life at Oxford, but delighted in the company of children, especially girls. A few of his witty pamphlets on univ. affairs were collected and pub. as *Notes by an Oxford Chief* (1865-74). His mathematical speculations were intricate and ingenious. Among such publications, under the name of C. L. Dodgson, are

A Syllabus of Plane Algebraical Geometry (1860); *Guide to the Mathematical Student; Elementary Treatise on Determinants* (1867); *Euclid and his Modern Rivals* (1879-85); *Curiosa Mathematica* (1888, 1894). His fame rests chiefly on *Alice's Adventures in Wonderland* (the first version of which was *Alice Underground*, a MS. which Dodgson gave to Mrs. Reginald Hargreaves, d. 1934, who was then Alice Pleasance Liddell, daughter of the dean of Christ Church, Oxford, and the original of Alice) (1865), and its continuation, *Through the Looking-Glass* (1872), both illustrated by Tenniel. These books are still the delight of children and grown-ups alike. They are full of whimsical fancies, grotesque absurdities, and unforgettable remarks and incidents. Though occasionally plagiarised, they are inimitable; and have become widely read classics, having been trans. into various tongues. The story of the conception of these books will be found retold in the obituary of Mrs. Hargreaves in *The Times*, Nov. 17, 1934. The first dramatised version appeared in London, 1886, but the play of necessity loses much of the charm of the book. In 1928 the MS. of *Alice in Wonderland* was sold to Dr. Rosenbach, an Amer. dealer, for £15,000, and later in the same year resold to Mr. E. R. Johnson of New Jersey for \$150,000, or £30,000. Later, Dr. Luther H. Evans, librarian of Congress, paid \$50,000 (£12,500) for the vol. at an auction and in 1948 presented the MS. and C.'s own drawings to the Brit. Museum 'as a gift from America to the Brit. people.' A centenary exhibition of C.'s works, portraits, etc., was held in London, 1932. The sole available copy in England of the first version of *Alice in Wonderland* was that owned by Sir Leicester Harmsworth, who also possessed a copy of a skit called *American Telegrams*, only one other copy of which is extant. C.'s other works are *Phantasmagoria and other poems* (1869), *The Hunting of the Snark* (humorous verse) (1876); *Doublets, a Word Puzzle* (1879); *Rhyme? and Reason?* (1883); *Principles of Parliamentary Representation* (1884); *A Tangled Tale* (1885); *The Game of Logic* (1887); *Sylvie and Bruno* (illustrated by Furniss) (1889); *Symbolic Logic* (1896). See S. D. Collingwood, *Life and Letters of Lewis Carroll*, 1898; I. Bowman, *The Story of Lewis Carroll told for Young People by the Real Alice*, 1899; W. de la Mare, *Lewis Carroll*, 1932; L. Reed, *The Life of Lewis Carroll*, 1932; F. B. Lennon, *Lewis Carroll*, 1947.

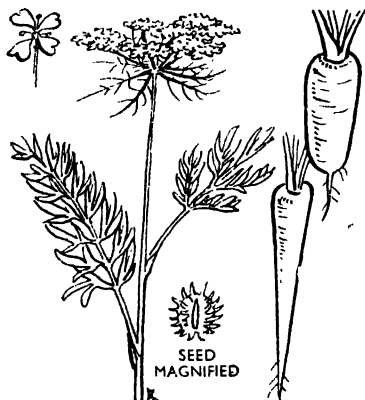
Carrollton, formerly a post-vil. of Jefferson par., Louisiana, on R. Mississippi, now suburb of New Orleans, U.S.A.

Carron, vil. near Falkirk in Stirlingshire, Scotland, on the R. C. is celebrated for its old-estab. iron works founded in 1759. Carronades and other guns were made here till 1852, when more modern armaments superseded them. Now, an extensive manuf. of stoves, grates, and boilers is carried on, which supports almost the entire vil. Pop. 3200.

Carronades, short cast-iron guns, attached to the carriage by loop and bolt

instead of trunnions, were invented in 1752 by Gen. Robert Melville, and made at Carron by Gascolgne for use in the navy. The metal was not so thick as that of most guns of the same calibre, and the powder chamber was at the muzzle, as in mortars. Only small charges of powder could be used, and they were of short range. Smaller long-range guns have rendered them obsolete.

Carron Oil, linewater and linsced oil mixed in equal proportions, as a dressing for burns. The name is derived from the C. foundry in Scotland, where, from its frequent use in the ironworks, its reputation was made. It is a soapy, thick mixture, now often replaced by neater dressings, such as a solution of bicarbonate of soda and a thin smearing of vaseline, or oxide of zinc ointment.



CARROTS

Carrot, plant of the genus *Daucus* and order Umbelliferae. The common C. (*Daucus Carota*), originally a native of the E., has been naturalised in Europe and America, and is a biennial plant. In E. U.S.A. it is often a pernicious weed. The root of the cultivated variety is much thicker and pleasanter in taste than that of the wild. The leaves are pinnately compound, the flowers creamy-white to pink or purplish in the central ones. The foliage is beautiful for decorative purposes and in Charles I.'s reign ladies sometimes even wore the leaves instead of feathers. Introduced into England early in the sixteenth century, it forms an article of food both for cattle and for man. The roots are also used for poultices. Cs. contain colouring matter used in some parts of Britain to colour butter. The white Belgian C. gives the largest crops. It has a thick white root, pale green above the earth. These are inferior to the red varieties for nutritive purposes. A deep, sandy soil, well drained and deeply trenched, suits best. It should be prepared and manured in autumn. The main crop is sown from late March to

April. The plants must be thinned out after sowing and kept free from weeds. During the winter the roots may be stored in a cellar or shed. Long-rooted kinds need about 3 ft. of soil; short horn varieties thrive in 6 in. of good compost on top of poorer soil.

Carrun, bor. in Victoria, Australia, 22 m. from Melbourne. Pop. 5000.

Carruthers, Robert (1799-1878), Scottish journalist and miscellaneous writer, b. at Dumfries. In his youth he was apprenticed to a bookseller, becoming editor of the *Inverness Courier*, 1828, and proprietor, 1831. He ed. *The Poetical Works of Alexander Pope* (1853). He collaborated with Robert Chambers to produce the *Cyclopædia of English Literature* (1843-1844); and with Wm. Chambers on his bowdlerised *Household Edition of Shakespeare* (1861-63).

Carruthers, William (1830-1922), Scottish botanist. Educated for the Presbyterian Church, but soon took up botany instead, becoming assistant in the botanical dept. of the Brit. Museum in 1859 and keeper in 1871. He was the pioneer in this country of seed testing, especially of pasture grasses. His contributions to the study of paleontology and of carboniferous flora were notable. He wrote many papers on systematic, palæontological, and agric. botany.

Carse, Scottish term for low, alluvial lands adjoining rivs., examples being the C. of Gowrie, C. of Falkirk, C. of Stirling. C. soils are usually very fertile, consisting of argillaceous deposits, but sometimes they are barren clays.

Carsebreck, loch in Stirlingshire, the great Scottish curling centre, 11 m. by rail from Stirling.

Carse of Gowrie, fertile dist. of Scotland, extending some 15 m. between the Tay and the Sidlaw Hills in Perthshire and Angus.

Carshalton, urban dist. of Surrey, England, 3 m. from Croydon, and 11 m. S. of London. Has an old church, some old fine houses and a public park; but it is chiefly a residential dist. for Londoners. Pop. 30,000.

Carsoli, com. of Italy on the site of the ant. Carsoli, 40 m. N.E. of Rome. There are extensive vineyards. The Palazzetto Orsini was completely destroyed in the Second World War, together with the medieval houses fronting the square. Pop. 7000.

Carson, Christopher (1809-68), familiarly known as 'Kit' C., Amer. trapper, guide, and soldier. He emigrated from Kentucky to Missouri as a hunter and trapper. His knowledge of Indian languages and habits made him excellent as a guide in Frémont's Rocky Mts. explorations, 1842-44. C. served under Frémont during the conquest of California, 1846-47, and settled in New Mexico, 1854, becoming U.S.A. Indian agent at Taos. For his services in the Civil war he was breveted brigadier-general. He d. at Fort Lynn, Colorado. He figures in Willa Cather's *Death Comes to the Archbishop*. See lives by De Witt C. Peters, 1858; E. S. Ellis, 1899; S. Vestal, 1928; and B. C.

Grant (ed.). *Kil Carson's Own Story of his Life*, 1926.

Carson, Edward Henry, Baron, of Duncairn, co. Antrim (1854-1935), Irish statesman, b. Feb. 9, second son of Edward Henry C., C.E., of Dublin, was educated at Portarlington School and Trinity College, Dublin. Here he obtained his M.A. degree, and later the honorary distinction of LL.D. He represented Dublin Univ. in Parliament as a Conservative, 1892-1918; then sat for Duncairn div. of Belfast, 1918-21. In 1894 he was appointed Queen's Counsel at the Eng. Bar, having held that office at the Irish Bar since 1889. Having acted as solicitor-general for Ireland in 1892, he was knighted, and became



LORD CARSON

solicitor-general in 1900, retaining the position till 1906. In 1896 he became Privy Councillor for Ireland, and in 1905 Brit. Privy Councillor. He led the Unionist campaign against the Parliament Act; and in 1912 he successfully engineered the signing of the covenant by which, at Belfast, Sept. 28, 1912, thousands bound themselves to refuse to recognise any Home Rule Parliament. The Ulster Unionist council became, in the latter part of 1913, a provisional gov., and C. was its head. In 1914 the First World War altered the complexion of matters; and C. joined Asquith's gov. in June 1915 as attorney-general, but resigned in Oct. as he disagreed with Sir Edward Grey's policy in the Balkans. Under Lloyd George C. was first lord of the Admiralty from 1916, and he supported the Irish Convention of 1917, in which year he quitted the Admiralty, but remained in gov. as a member of the War Cabinet. At the close of the war he agreed to dividing N.E. Ireland from the rest of the country. Of commanding presence and magnetic in appearance, and speaking

with a musical brogue, C. was one of the most formidable yet attractive forensic orators of his day. He was given a life peerage June 1, 1921, and became a lord of appeal D. Oct. 22, at Cleve Court, Munster.

Carson City, cap. of Nevada, U.S.A., and the co. tn. of Ormsby co., 121 m. N.E. of Sacramento, on the Virginia and Truckee railway. Its chief industry is agriculture, and it is the centre of a mining dist. Pop. 2000.

Carso Plateau, situated on the gulf of Trieste, was the scene of fighting between the Austrians and It., during the First World War. The first campaign in this area commenced in Sept. 1916, when the It., under Cadorna succeeded in capturing the heights at San Grado and other important positions. Further It. progress on the C. P. was made in Nov. 1916. The road to Trieste was, however, blocked by the Austrian strong positions on Mt. Hermada, and in the spring of 1917 plans were made for capturing these. In the middle of May operations commenced and much progress was made in the sector S. of Gorizia. Brit. monitors in the gulf of Trieste assisted in these operations. After a lull fighting began again in Aug. 1917, but, though yet further progress was made on the C. P., the It. debacle of Caporetto (*q.v.*) caused their forces on the C. P. to retreat hurriedly and no further fighting took place in this theatre.

Carstairs, par. 3½ m. E.N.E. of Lanark, with an important railway junction, in the S. of Lanarkshire, Scotland. Pop. 2000.

Carstares, William (1649-1715), Scottish minister, son of a minister of Cathcart, near Glasgow, who had been taken prisoner at the battle of Dunbar by Cromwell and exchanged. He was educated at the college of Edinburgh, and in Holland, where he studied under the most celebrated profs., and was probably ordained in the Dutch Church. He also made the acquaintance of William of Orange, and became his confidential adviser. In 1672 he came to London, and was arrested by Lauderdale on petty charges of creating disturbances. Nothing was proved against him, and he was kept a prisoner in Edinburgh Castle for five years. He returned to Holland, and from there made frequent visits of investigation, acting as agent between Eng. and Scottish conspirators, in conjunction with Shaftesbury, Russell, and Argyll. After the Rye House Plot, which he really did not uphold, he was arrested and again imprisoned, and on his release he sought security in Holland, where he became chaplain to William of Orange. In reconciling the Scottish Church his influence was invaluable, his advice having the greatest possible weight with William. Under Anne he was elected principal of Edinburgh Univ. and presented with a living.

Carstens, Armus Jakob (1754-98), Ger. artist, b. near Schleswig. He was apprenticed to a wine merchant for five years, but at the age of twenty-two he went to Copenhagen to study art. Then followed a period of great poverty in Lübeck and

Berlin, during which he barely supported himself by portrait-painting. He was released from penury by the success of his great composition 'The Fall of the Angels,' which contains 200 figures, and which gained for him the patronage of the court, a professorship at the Berlin Academy, and a pension. He now visited Rome, in order to study the works of Michelangelo and Raphael, and his enthusiasm for these masters had a most stimulating effect on Ger. art. His numerous drawings represent chiefly subjects from the anct. classic poets and from Ossian and Shakespeare. Towards the end of his life he broke with the academy, and d. at Rome in extreme poverty.

Cart (probably from Old Norse *kartr*, of O.E. *cræt*, of doubtful meaning), term for various kinds of vehicle, strictly two-wheeled, topless and springless, usually designed to carry heavy loads and to be drawn by one horse. It is the most primitive form of carriage or chariot (*q.v.*). Cs. are generally for agric. or postal purposes, for transport of goods or luggage (farmer's C., tradesman's C., carrier's van). Combined with other words it may denote special kinds of pleasure-carriages. Examples are the dog-C. (originally made for the conveyance of sporting dogs), a rather high, two-wheeled carriage with seats back to back, in front and behind. These are particularly suited for tandem driving. The gadabout is a dog-C.; the Whitechapel C., gig (stanhopes and tilburys included) are other varieties. The governess C. is a very low, two-wheeled pony-carriage with two side seats facing inwards. Other two-wheeled Cs. are the Irish jaunting car, the Canadian calash, and the Amer. trotting sulky. The dump-C. is one that can be unloaded by tilting the body of the vehicle, and is much used for carting away stones and refuse.

Cartagena, fortified seaport of Spain, 326 m. S.E. of Madrid. It was formerly the largest naval arsenal in Europe, and its harbour, enclosed by hills, and commanded by a fortified is. on the S. side of the narrow entrance, is capable of holding the largest fleet. It has a naval wireless station. Built by Hasdrubal (242 B.C.) under the name of New Carthage, it was of great importance under the Romans. C. was twice taken by the Brits. In the eighteenth century; was seized by the com., 1873; and retaken by the national force, 1871. Pop. 114,200.

Cartagena, cap. of Colombia, was founded 1533. It has a fine harbour, and the Dique Canal connects the port with the Magdalena R. C., once the richest city in the New World, was taken by Drake, 1585; pillaged by Fr. buccannere, 1697; bombarded by Adm. Vernon, 1741; taken by Bolívar, 1915, but surrendered to the royalists soon afterwards. Freed from the Sp. yoke, 1821. Exports cotton, sugar, hides, tobacco, coffee, cacao. Pop. (including suburbs) 106,800.

Cartago, cap. of the prov. of C. in Costa Rica, Central America, 12½ m. E.S.E. of

San José, on the transcontinental railway. It is situated on a fertile tableland, 4930 ft. above sea level, at the base of the volcano Irazu (11,200 ft.), near which are hot mineral springs—the resort of invalids. An earthquake in 1723 caused the city to be flooded by water from the crater; in 1841 the greater part of the city was destroyed by earthquake. It is noted for its fine coffee. Pop. 13,100.

Carte, Richard D'Oyly, see D'OYLY CARTE.

Carte, Thomas (1686–1754), Eng. historian, received his education at Univ. College, Oxford, and took his M.A. degree at both Eng. univs. He was appointed reader at the Abbey Chapel, Bath, but resigned (1714) rather than swear allegiance to the Hanoverian gov. He pub. *An History of the Life of James, Duke of Ormonde* (1735–36) and *A General History of England* (1747–55). Most of his MSS. are preserved in the Bodleian Library, Oxford.

Carte blanche, a blank paper with an authoritative signature, to be filled up as the recipient wishes. Thus, the C. sent by Charles II. to the Eng. Parliament, to be filled with their own terms as the price of his father's life; and that given in 1832 to Earl Grey for the creation of new peers. In piquet, a hand containing no picture cards.

Cartel (Fr., from It. *cartello*, dimin. of *carta*, paper), term applied to a document which regulates the exchange of prisoners of war. The Cs. decree the values of prisoners of different rank, who are now exchanged on this basis instead of by ransom. A C. ship is one of truce, exempt from capture; it is used to convey prisoners who are to be exchanged. C. has now come to mean an industrial combine or trust, and this meaning is derived from the Ger. use of the word *Kartell*, which was first applied to a combine of railway material manufacturers in 1879. The industrial C. arose out of the need to control the stocking of the market in order to stabilise prices. From that it developed into an organisation which instituted a central selling office to dispose of the product for the benefit of all members of the C. In some Cs., however, each constituent member was left free to operate its own market, although the output and price were controlled by the C. In 1883 'Irma,' the International Rail Makers' Association, came into being, and was the first of the international Cs. which became a feature of modern industry, especially after the peace treaties following the First World War. States at one time politically and still industrially united were then split up, making international industrial agreements essential. In small industries, such as the magnesia industry, the C. amounts to a close combine governing a monopoly. In larger industries, however, an international C. may be no more than an agreement between national combines to respect each other's markets. International Cs. have been engendered by the tariff system, and being liable to the abuses often allied to a monopoly, Cs.

have been from time to time subjected to political control.

International Cartels.—Although C., in the strict sense, means a production and marketing agreement between private firms directed at the restriction of output or sales by the member firms, at an allocation of market territory, and at the fixing of the price of products, its meaning in current usage has extended so as to include patent and process exchange agreements between firms in different countries—such, for example, as those concluded by Standard Oil, International General Electric, and other Amer. concerns, with foreign interests. Often patent exchange arrangements contain marketing agreements and, in fact, the marketing agreements may be the reason for exchange of patents and processes. This type of C. arrangement is, probably, the one which primarily concerns Amer. firms. International Cs. are sometimes formed under governmental auspices and with gov. participation and, indeed, some of the most notorious international Cs. have been negotiated by govts. This was true of the tin and rubber Cs.; while, again, the U.S. Gov. entered into agreements for wheat and coffee. If, in the future, other govts. participate in international Cs. in industrial materials and manufactured products, not only will much of the international trade of the world be brought under a high degree of commodity control, but the distinction between Cs. and commodity agreements will tend to disappear. In the course of the Second World War anti-C. critics were loud in their condemnation of international Cs., regarding them as monopolistic, conspiratorial, and even fascist in character; whereas pro-C. critics, like Lord McGowan of Imperial Chemical Industries, have described Cs. as a means of assuring orderly marketing, planned expansion of international trade, and elimination of cut-throat prices. It may be plausibly argued that most of the big international Cs. have sprung from the existence of a serious lack of balance between productive capacity and current consumption of the products in question, and also that a functioning international C. has generally postulated the effective prior organisation of producers in the domestic market. Extensive Amer. participation in Cs. would seem to require a considerable degree of co-operation between firms in the domestic market, but since the U.S.A. is committed to an anti-trust policy at home, such participation seems improbable, at least in those industries in which exporting firms are not only many in number but also occupied in producing for the domestic market. Amer. hostility to monopoly is not necessarily shared by other countries, and many European countries may favour international Cs., together with import restrictions, export bounties, and other measures designed to cope with excess production.

The menace of the great Ger. Cs. which existed before the Second World War lay in the fact that these great combines were

producers for the Ger. war machine. Most of them were excessive in size, were monopolists, and essentially anti-democratic. For these reasons decartellisation laws were made for the Amer. and Brit. zones of occupation in Germany early in 1947. Some five U.S. zone concerns, with about £25,000,000 assets, were automatically considered as being 'excessive' concentrations by employing 10,000 or more persons: the Opel motor works at Russelsheim; the Bosch works at Stuttgart; the Metall Gesellschaft at Frankfurt; the Gute Hoffnungs Hütte, with headquarters at Oberhausen (in the Brit. zone) and large subsidiary works at Nuremberg; and the Degussa works. The trial in 1947 before an Amer. military tribunal at Nuremberg of Germany's vast chemical combine, I. G. Farben Industrie (Dye Trust) as war criminals showed that the combine participated in no fewer than 500 undertakings outside Germany, apart from its foreign manufacturing plants and holding companies. Working intimately with Nazi foreign policy its international affiliations and contracts ran into thousands, including C. agreements with major concerns in America, Britain, France, and many other European countries, which were used as an economic weapon in the preparation of war. From 1935 onwards, all C. agreements were cleared by Farben through the military economic staff of the *Wehrmacht*. Their deliberate purpose was to restrict industrial development and scientific research outside Germany, especially in countries which Hitler designed to attack. It was also shown at the trial how a C. arrangement among Farben, the Aluminum Company of America, and the Dow Chemical Company greatly restricted the production of magnesium in the U.S.A. and prohibited exports to Europe except to Germany and, in negligible amounts, to Great Britain—so that Britain and the rest of Europe became completely dependent on Germany for magnesium, for which Britain was in a desperate situation on the outbreak of war. The trial also showed how, by means of C. agreements with the Standard Oil Company of New Jersey, Farben delayed the development and production of buna rubber in the U.S.A. until 1940, while at the same time making Germany independent of rubber imports. See *International Cartels, Combines, and Trusts*, with essay by the Ger. authority, R. Lefmann, trans., 1927; also H. Levy, *Monopolies, Cartels, and Trusts in British Industry*, 1927; A. P. L. Gordon, *The Problem of Trust and Monopoly Control*, 1928. See also under COMBINE and TRUSTS (COMMERCIAL).

Carter, Elizabeth (1717–1806), Eng. poet and translator, famous for her knowledge of languages, pub. her first vol. of poetry at the age of twenty-one, and in the following year trans. from the It. of Algarotti *Sir Isaac Newton's Philosophy explained for the Use of Ladies*. Her trans. of Epictetus (reprinted in Everyman's Library), etc., won the admiration of Dr. Johnson and other learned contemporaries.

Carter, Howard (1873-1939), Eng. Egyptologist, b. at Swaffham, Norfolk, youngest son of Samuel John C., animal painter. Educated privately. Went to Egypt on the staff of the Archaeological Survey, 1890; engaged in excavation till 1899, notably with Sir Flinders Petrie at Tel-el-Amarna. Became inspector-general of antiquities dept. of Egyptian Gov., and made numerous excavations; and finally, under the direction of the earl of Carnarvon, on Feb. 17, 1923, opened the sealed door of the tomb of Tut-ankh-Amen, a noted king of the XVIII. dynasty, who reigned 1300 years B.C. Publications: *The Tomb of Thout-mosis IV.* (with P. F. Newbery), 1904; *Description and Excavation of the Tomb of Hâtshetsitâ* (1906); *The Tomb of Tut-ankh-Amen* (with A. C. Mace), 1923-1933).

Carter, Robert Brudenell (1828-1918), Eng. ophthalmic surgeon, received his medical training at the London Hospital. During the Crimean war he served as staff-surgeon, and won both Eng. and Turkish medals. In 1870 he was appointed ophthalmic surgeon to St. George's Hospital, and from 1893 to 1903 still attended that hospital for consultations. The Royal College of Surgeons gave him in 1881 the Hunterian professorship of pathology and surgery, and he later accepted the Luncheon lectureship from the London Medical Society. He trans. Ger. ophthalmic works, and was the author of sev. original treatises on eye diseases.

Carteret, Sir George (c. 1609-80), Eng. naval officer and Royalist politician, nephew of Sir Philip C. (d. 1643). By 1633 he was a captain in the navy; comptroller of the navy, 1639. C. became lieutenant-governor of Jersey, 1643. He was knighted, 1646, and was one of the original proprietors of New Jersey in America, 1650. Forced to yield Jersey to the Commonwealth, 1651. C. served for a time under Vendôme in the Fr. Navy. He was treasurer of the Eng. Navy, 1661-1667. C. became sole proprietor of E. New Jersey, 1676; he was also one of the original proprietors of Carolina.

Carteret, John, first Earl Granville (1690-1763), Eng. statesman, was educated at Westminster School and Christ Church College, Oxford. From univ. he entered immediately into the vortex of the political life of the metropolis, and in 1711 took his seat in the House of Lords as second Baron C. As he was Whig by conviction, he followed the leadership of Stanhope and Sunderland. From 1719 to 1724 he distinguished himself for his diplomatic services. Dispatched by Stanhope as ambas. extraordinary to Sweden, he negotiated two treaties; one between Sweden and Hanover and Prussia, the other between Sweden and Denmark. In 1723 he was present at the somewhatⁿ ineffectual congress of Cambrai. His notable lord-lieutenancy of Ireland dates from 1724. The abolition of Wood's coinage was due largely to his recommendations, and though he embroiled himself with Swift over his

determined prosecutions for *Drapier's Letters*, he ended by gaining the dean's highest respect and admiration. From 1730 to 1742 he devoted his activities to the overthrow of Walpole's ministry, and having achieved his object, became the true leader of the subsequent Cabinet. When the Pelhams came into power in 1744, C. ceased to be a political force, though in 1751 he accepted the Lord Presidency of the Council. C., who was twice married, is described by Horace Walpole as of 'commanding beauty,' and enjoyed a high contemporary reputation for his oratory, wit, and sociability no less than for his classical learning.

Carteret, Philip (d. 1796), Eng. navigator, was commander of the second, and unseaworthy, vessel in Wallis's expedition to the S. hemisphere in 1766. Having accidentally lost sight of his leader, he was alone when he discovered Pitcairn Is. and when he gave his name to one of the Solomon Archipelago. He contributed considerably to contemporary geographical knowledge.

Cartesian Ovals, see **OVALS**.

Carthage, anct. city situated on a promontory at the N.E. extremity of the bay of Tunis (Africa), the cap. of one of the most important empires of the anct. world. Known to the Romans as Carthago and to the Gks. as Karchedon, its true name was Kirjath-Hadesath, or New Town. This name was given either to distinguish it from Tyre or from an earlier settlement at Utica. Its exact position on the promontory is not known, but the city was distinguished by its citadel (Byrsa), which was approached by sixty steps. It had two harbours, one for merchant ships and one for warships. Outside the walls of the city was the beautiful suburb of Megara. C. was settled by the Phœnicians of Tyre, a branch of the great Semitic race, about the middle of the ninth century B.C. There were already Punic settlements in the N. of Africa—Utica, Tunis, and Hadrumetum—but of these C. finally obtained the chiefdom. The story of the city's first struggles for power are unknown, for she does not enter hist. till the sixth century B.C., when she is already the centre of a prosperous commerce, and the ruler of extensive dominions, extending from Cyrene to the straits of Gibraltar, with most of the W. Mediterranean Is., and with settlements in Spain and Gaul. The pop. of the city and its dist. consisted of (1) pure Phœnicians; (2) the Libyo-Phœnicians, the offspring of intermarriages between the settlers and Africans; (3) the Libyans themselves, reduced to servitude and forming a large part of the Carthaginian army; (4) the Nomads, wandering tribes which furnished the city with irregular cavalry. The extent of the commercial genius and maritime daring of the Carthaginians may be seen from the fact that Hanno, one of their admirals, is reported to have sailed, in the sixth century B.C., round the N.W. of Africa and up the Senegal R., returning then only through the failure of his provisions. The hist. of C. is mainly taken up by its wars with the Gks. and

Roms., and to the first of these we must turn. The struggle was waged chiefly in Sicily, where C. came into conflict with the Gks. of Syracuse. In 480 B.C., a great battle was fought at Himera, between Hamilcar and Gelo of Syracuse, and the former was defeated and slain. Some time later the war was renewed, and Hannibal, grandson of Hamilcar, entered Sicily to avenge his grandfather, which he did by storming Selinus and capturing Himera. In 405 a treaty was made, but seven years later war broke out afresh, and Dionysius, tyrant of Syracuse, was besieged in his city. He was saved, however, by the pestilence which broke out among the Carthaginians, and the latter were quite defeated. The struggle continued, till in 344 Syracuse sent for help to the mother city of Corinth, and received auxiliaries under Timoleon, who inflicted a crushing defeat on the Carthaginians at the Crinissus in 340. There was peace for thirty years, until Agathocles was tyrant of Syracuse. Then C. again attacked, but Agathocles transferred his forces to Africa, and carried the war to the very walls of C., which he would have taken had he not been suddenly called home. In 277 B.C., Pyrrhus was called to the aid of the Syracusans, but Rome and C. were engaged against him, and he could do nothing permanent. More important even than this war was the mighty struggle with Rome. Treaties made between the two cities in 509 B.C., and about 450 B.C., show that C. was then the superior, and was gradually increasing her restrictions on Rom. commerce. The first war lasted from 264 to 241 B.C., and once again Sicily was the cause. The Roms. hastily built a fleet, and won two great sea-fights at Mylae (260) and at Ecnomus (256 B.C.). Regulus carried the war into Africa, but his army was entirely cut to pieces. Peace was made after another naval victory for Rome. From 241 to 236 B.C., C. was engaged in a bloody civil war, which demonstrated the insecurity of her home rule. This led the great Hamilcar to establish himself in Spain, and to try to found there a new empire which should subdue Rome. After his death and that of his son-in-law Hasdrabal, his son Hannibal, sworn enemy to Rome, was chosen leader of the army. His attack on Saguntum in 219 B.C. was the commencement of the second Punic war (see HANNIBAL). The battle of Lame in 202 put an end to this war, and for the next fifty years the hist. of C. is mainly a record of political struggles. It was continually harassed by Rome, and in 149 B.C. C. was goaded into the third Punic war. It lasted for three years. C. being taken and utterly destroyed. At that time the city is said to have had 700,000 inhab. *Consult* monograph by R. Bosworth-Smith, 1878; F. W. Kelsey, *Excavations at Carthage*, 1926; and the *Cambridge Ancient History*, vol. iv.

Carthage, co. seat of Jasper co., Missouri, U.S.A., on the Spring R., 150 m. S. by E. of Kansas City. It is the seat of the C. Collegiate Institute (Presbyterian). It is a market centre, and manufs.

furniture and machinery. It was the scene during the Civil war of a skirmish called the battle of C. Pop. 10,500.

Carthage, Cape, promontory of N. Africa, jutting out into the Mediterranean. N. of Tunis lagoon are ruins of the anct. city of C.

Carthage, Synods of, chief of these were held in A.D. 411-12, the first to refute the tenets of the Donatists (q.v.) and the second to discuss the Pelagian heresy. Augustine and Petilian were the chief protagonists of the first synod, while Marcellinus, tribune to the Emperor Honorius, was president, and decided against the Donatists. In the ensuing year, Paulinus of Milan was cited to appear at the synod held at the instance of Aurelius, bishop of C., as the accuser of Coelestius. Here the Pelagian heresy received its first condemnation, and at the same time, its first explicit recognition. *Consult* Schaff, *Church History*.

Carthago Nova, see CARTAGENA.

Carthamin ($C_{15}H_{15}O_2$), red colouring matter prepared from safflower. It is used as a dye for silks and cottons and requires no mordant.

Carthamus, genus of Composite common to Asia, Africa, and the Mediterranean. *C. tinctorius*, the safflower, is an annual found wild in Egypt and the Levant; the flowers contain a colouring principle, and are used by dyers as the source of delicate rose colours and rich scarlet, while mixed with talc they form the cosmetic known as rouge.

Carthusians, monastic order founded in 1086 by St. Bruno and six companions, who retired to La Chartreuse, and there built hermitages, dressed in rude habits, and ate only vegetables and coarse bread. The fifth prior, Guigo, in 1130 composed a list of rules, entitled the *Statuta Guigonis*, or *Consuetudines Cartusiae*, and in 1176 the order received papal recognition. The C. were divided into two classes, fathers (*patres*) and brothers (*converses*), and each occupied a separate cell, furnished sparsely with a straw bed, pillow, coverlet, and writing materials. They lived in isolation, and never left their cells except for festivals or for the funeral of a fellow C. Their habit consisted of a haircloth shirt, a white cassock, and over these a black cloak. The order at one time counted sixteen provs., and possessed many magnificent convents: La Grande Chartreuse, near Grenoble, the original monastery, and the home of the famous liqueur; Certosa, near Pavia; and a richly decorated convent at Naples. Their prin. seats were in Italy, France, and Switzerland, but most of these have been destroyed, or have fallen into decay. The C. were despoiled and exiled from France during the Revolution; and as in 1880 they had declined to accept indulgence from the decrees against religious orders, the brothers were evicted during the anti-clerical movement of 1902, and their home was sold by gov. authority. The order was estab. in England in 1180. The London Charterhouse (a corruption of Chartreuse) was founded in 1371, and abolished during the dissolution of the

monasteries by Henry VIII. Strangely enough, this building eventually became a 'masterpiece of Protestant English charity' (Fuller). The C. nuns arose at Salette, on the Rhône, 1229. They followed the rules of the monks with some modifications, notably that of a common refectory.

Cartier, Sir Georges Etienne (1814-73), Canadian statesman, entered the Canadian Parliament in 1848. A leader of a rebellion against Brit. rule in 1837, his political ideas underwent so radical a change as to prompt him to join the reconstructed Liberal-Conservative party in 1854. As attorney-general for Lower Canada, he promoted the codification of the civil law of that prov. (1857-64). His alliance as joint premier of Canada with Sir John Macdonald lasted from 1858 to 1862. As a statesman he was largely responsible for the entrance of Quebec into the federation (1864-67), for the removal of seigneurial tenure from Lower Canada, and for the Grand Trunk railway as well as for the final determination, to construct the Canadian-Pacific. Received a baronetcy for his services.

Cartier, Jacques (1491-1557), Fr. navigator, famous as the discoverer of the great St. Lawrence R., Canada. In 1534 he put out with two ships from St. Malo with intent to find the N.W. passage to Japan. Disappointed, he returned home, but in 1536 he set sail once more, landed in Pillage Bay, opposite Anticosti, which he named the bay of St. Lawrence—a name afterwards extended to the riv.—and learned from some Huron-Iroquois Indians that he was in the land of Canada—a native word for village. Exploring the riv. in long boats as far as the site of Montreal, he was able to look down from Mt. Royal on to the Ottawa and St. Lawrence stretching far to the W. The attempt in 1541-43 to find the mythical Saguenay, a wealthy kingdom, which, according to Indian story, lay up the Ottawa, ended in failure. The four-hundredth anniversary of his landing in the bay of St. Lawrence was officially celebrated in Canada in 1934, when Adm. Sir Roger Keyes and Mr. H. A. L. Fisher were present as the representatives of the Brit. Gov.

Cartilage, gristly tissue existing at various parts of the body. It takes the place of bone where yielding is required, as at the joints and in various tubes. It is the precursor of bone, and in the foetus C. exists instead of bone, except in the case of some of the flat bones. It is of three kinds. Hyaline C. is glassy and is found at the end-joints, such as the points where the ribs are connected to the breast-bone and in the nasal Cs. It contains no blood vessels. White fibrous C., in which there are white fibres arranged in layers, occurs in the knee-cap and vertebral column. Yellow elastic C. has a matrix of yellow elastic fibre, and is in the ear, epiglottis, and Eustachian tubes. None of these varieties of C. contains any nerves.

Cartilaginous Fishes, or Elasmobranchii, sub-class of the Pisces, so called on account of their gristly endoskeleton.

They are, with a few exceptions, entirely marine, and include the sharks, dog-fishes, skates, and rays. See ELASMOBRANCHII.

Cartmel, mkt. tn. on the London Midland Region railway, 12 m. N.W. of Lancaster in Lancashire, England. It is famous for its remains of an Augustinian priory. Pop. 300.

Cartography, see MAPS.

Carton, Richard Claude (1853-1928) (whose real name was Critchett), Eng. dramatist and actor. His comedies enjoyed a considerable vogue for some twenty-five years from the appearance of *The Great Pink Pearl* and *The Treasure* (both of these with Cecil Raleigh) in the eighties. Other plays were *Liberty Hall*, perhaps his best, produced in 1892 and revived in New York twenty years later; *Lord and Lady Allyn*, in the vein of Oscar Wilde, but far less adroit in dialogue; *Sunlight and Shadow*; *The Home Secretary*; and *Other People's Worries*.

Carton-pierre, substance very similar to papier mâché, used as a substitute for plaster in making mouldings for walls, roofs ceilings, etc.

Cartoon (It. *cartone*, pasteboard, from Lat. *charta*, paper), design on strong paper, representing, in full size, some contemplated work of art, and intended to assist the artist in the composition of his work. The design when finished is transferred by tracing or pouncing to the surface finally to be worked upon. The most famous Cs. are those of Raphael which were executed for the celebrated tapestry of the Vatican. These designs were purchased by Charles I., repurchased by Cromwell for the nation, restored by William III., who built for them a gallery at Hampton Court, and lent to the S. Kensington Museum, 1865. Unfortunately, out of the original twenty-five, only seven remain. Those of Leonardo da Vinci ('The Battle of the Standard') and Michelangelo ('Soldiers attacked while Bathing') have perished, but others are preserved in the Ambrosia Gallery, Milan, and in the Sala Borgia. Modern Ger. artists have prepared accurate Cs., the most noteworthy being the designs of Cornelius for his fresco paintings in Munich. In England there was a revival of C. work in 1813-44, during the competition for the House of Parliament paintings. Dyce and Maclellan have left fine examples in this line. A large-sized drawing in a periodical may be called a cartoon. The word C. is commonly used to-day as a synonym for a political or social caricature. See CARICATURE.

Cartouche: 1. In architecture signifies any scroll-shaped ornamentation, such as the volute of an Ionic capital, the oval tablets on which the arms of the popes were engraved, and the oblong devices in Egyptian monuments and papyri containing royal names carved in hieroglyphic characters. It is used especially of any inscriptive tablet sculptured so as to represent a half-unrolled sheet of parchment. 2. Meaning originally 'a roll of paper,' was used of the wooden case enclosing cannon balls and later of the waterproof canvas case for cartridges.

The word cartridge, meaning a case for explosive charge, is merely a corrupt form of C.

Cartridge, case containing the powder required to charge a fire-arm, sometimes containing the bullet also. In the Cs. for cannons or large guns, the C. contains powder alone. It is formed of a serge or flannel bag, containing a fixed quantity of powder tied round the neck and stiffened by worsted hoops. Since serge is inclined to smoulder after ignition, silk bags are frequently used for salutes and drill. For small arms, the C. consists of a



EDMUND CARTWRIGHT
An engraving by J. Thomson.

brass C.-case, containing bullet, powder, and primer. Cs. originally came into use for muzzle-loading rifles, and in these bullet and powder were wrapped together in a paper cylinder. When required for use, the end of this was torn or bitten off and the powder poured down the muzzle. The bullet and the C.-paper were then rammed down on top. A somewhat similar C. was in use with the first breech-loaders, and the introduction of the steel, soon changed to copper, percussion cap marks the next stage in development. This cap, containing a detonating compound of chlorate of potash, sulphur, and charcoal, soon led to the introduction of the modern C. case, and made it adaptable for all kinds of rifles. The modern C. for breech-loading small arms consists of a solid brass cylinder at the base of which is the detonator, and most pistol and revolver Cs. are constructed on the same pattern. In the case of breech-loading shot-guns, the C. generally consists of a stout paper case with a brass base, or else of thin brass throughout. Ignition may be either by pin or central fire. Blank Cs., which are used for drill, salutes, etc., contain only powder and primer, but no bullet; while dummy Cs. contain no powder. These last are used for drill

purposes, where practice in the handling of Cs. might sometimes lead to dangerous accidents. *See also* AMMUNITION.

Cartwright, Edmund (1743-1823), Eng. inventor of the power-loom, was b. at Marnham, Nottinghamshire. Educated at Oxford, he afterwards obtained the rectorship of Goadby-Marwood, Leicestershire. A visit to Arkwright's cotton mills resulted in his invention, and he set up power-loom first at Doncaster, then at Manchester. He met with great opposition and no pecuniary gain, but in 1809 the gov. made him a grant of £10,000.

Cartwright, Sir Fairfax Leighton (1857-1928), Brit. diplomatist, serving, at various times, in European caps., in Central America, and in Teheran. He is remembered for his unremitting efforts, during his tenure of the embassy at Vienna from 1908, to secure a peaceable solution of the difficult question of Austro-Turkish relations regarding Bosnia-Herzegovina, the outcome of which was the annexation of the country by Austria-Hungary. In these efforts he attracted the ill will of the Ger. emperor, William II., and in 1913, when it was proposed to appoint him ambas. to Berlin, the emperor intimated that C. was not *persona grata*. Wrote *The Mystic Rose from the Garden of the King*, trans. from Persian poetry and tales (1925).

Cartwright, John (1740-1824), 'the father of reform,' entered the navy in 1758, and within eight years had been advanced to the rank of first lieutenant. He retired from the service in 1777, his sympathies with the Amers. preventing him from joining Lord Howe's fleet. He had already begun to express his political opinions, and his first pamphlets were on the question of Amer. taxation. He pub. in 1774 his first plea on behalf of the colonists, entitled *American Independence the Glory and Interest of Great Britain*. He became an ardent reformer, and held meetings and wrote tracts to further the movement of political liberty. He desired to ventilate his views on the floor of the House of Commons, but was unsuccessful in each of his sev. efforts to find a constituency to return him to Westminster. He was one of the originators of the Society for Constitutional Information in 1780. *See* F. D. Cartwright (his niece), *Life and Correspondence of Major Cartwright*, 1826.

Cartwright, Sir Richard John (1835-1912), Canadian statesman, entered the Canadian Parliament as a Conservative, but finally joined the Liberals in 1870, and became their minister of finance in 1873. He was remarkable for his strict economy, and during the years of opposition, 1878-96, acted as financial critic to his party. In 1896 he was appointed minister of trade and commerce under Sir Wilfrid Laurier, and from 1898 to 1899 represented Canada on the Anglo-Amer. Joint High Commission at Quebec and Washington. Though he retired from the senate in 1904 owing to failing health, he was acting Premier in 1907 during Laurier's absence at the Imperial Conference.

Cartwright, Thomas (1535-1603), Eng.

divine. During a stormy life of persecutions, he did much to strengthen and organise Puritan doctrines. In 1570-71 Whitgift deprived him of both his divinity professorship and his fellowship at Cambridge. The rest of his life was divided between visits to the Continent, to Geneva, Antwerp, the Channel Is., etc., and imprisonment, chiefly in the Fleet, for his pronounced Presbyterian views.

Cartwright, Thomas (1631-89). Eng. divine, grandson of the above. Educated at Northampton and Oxford, he became taberner of Queen's College, and studied under Tully, 1650. Secretly ordained by Bishop Skinner, 1655, C. became vicar of Walthamstow, 1657. He was prebendary of Wells, 1660; of St. Paul's, 1665; dean of Ripon, 1675; bishop of Chester, 1686. He was a staunch supporter of James II., who made him bishop of Salisbury. See J. Hunter's ed. of *Diary of Thomas Cartwright, Bishop of Chester*, 1843.

Cartwright, William (1611-43). Eng. dramatist and divine, b. near Tewkesbury, was sent as a king's scholar to Westminster, whence he was chosen (1628) as a student of Christ Church, Oxford. He took his M.A. 1625, and entered into holy orders. He was nominated one of the Council of War, and in 1642 was imprisoned by Lord Say, but released on bail. His plays and poems were collected (1651) by Humphrey Mosely, the comedy, *The Royal Slave*, a satire on the Puritans, being the most noteworthy.

Carucate (from Med. Lat. *carrucata*, from *carruca*, a wheeled plough), formerly measure of land, being the amount that could annually be ploughed by a yoke of oxen. The *carucage* was an impost levied on each C. of land. Some think the C. was always equivalent to a hide of land, and Richard II.'s tax of five shillings on every *carucata terre sive hyda* may be quoted in support of this view. The term, which was evidently of Dan. origin, was used in dists. inhabited by descendants of the Danes. In the beginning of the thirteenth century its size was fixed at 100 ac.

Carum, name of an umbelliferous genus of sub-tropical and temperate plants, which are glabrous herbs with perennal tuberous roots, pinnate leaves, and white flowers. *C. petroselinum* is the common parsley, and *C. Caru*, the common caraway, is cultivated for its fruit, known as caraway seeds (*q.v.*).

Caruncle, botanical term for a hard, small extra seed-covering, or *ruil*, also called a *strophole*. Examples may be seen in species of Euphorbiaceae, e.g. in *Euphorbia lathyris*.

Carúpano, one of the first-class ports of Venezuela, S. America, in the state of Bermúdez on the N. coast of the peninsula of Paria, with a lighthouse and excellent harbour. Sulphur, copper, silver, lignite, and lead are mined in the neighbourhood. High tariffs and poverty keep down the foreign trade, the exports for which are cocoa, coffee, hides, etc. Pop. 26,000.

Carus, Julius Victor (1823-1903), Ger. zoologist, studied medicine at Leipzig,

Würzburg, and Freiburg, and in 1849 became keeper of the museum of comparative anatomy at Oxford. His appointment to the chair of comparative anatomy at Leipzig dated from 1853. Though he was the author of sev. scientific text-books, such as *Handbuch der Zoologie* (with Gerstärker, 1863, etc.), his splendid monographs on many problems in zoological research were his most valuable contribution to contemporary science.

Carus, Marcus Aurelius (282-83), Rom. emperor, surnamed Persicus, who was elected by the soldiers on the death of Probus. He was a scholar and a soldier, and immediately after his accession he set out to war against the Persians, first conferring on his two sons, Carinus and Numerian, the title of Cæsar. He ravaged Mesopotamia, conquered the important cities of Seleucia and Ctesiphon, and advanced beyond the Tigris, when his sudden death by lightning put an end to his hopes for the conquest of Persia and Arabia and the submersion of Egypt.

Carus, Paul (1852-1919), Amer. writer, b. at Isenburg, Germany, July 18, 1852; son of Dr. Gustav C., educated at Stettin Gymnasium and the univ. of Strassburg and Tübingen. He was the author of a large number of works on science, relativity, religion, and on Buddhist and Chinese philosophy.

Caruso, Enrico (1873-1921), It. tenor, b. at Naples, one of a large family in humble circumstances. He began his study of singing at eighteen, under Guglielmo Vergine; and he made his first appearance on the stage in 1894. In 1899, at Milan, he created the part of Loris in Giordani's *Fedora*. He was the original prin. tenor in Cilea's *Adriana Lecourcœur* and Franchetti's *Germania*. In the spring of 1902, at Monte Carlo, he sang with Mme Melba in *La Bohème*. He was then engaged for Covent Garden, London, where he appeared as the duke in *Rigoletto*, May 14, 1902. Without any special musical training he early attained a world-wide fame. Sang at Covent Garden for some years prior to 1907, when he received the M.V.O. In the same year he went to the Metropolitan Opera House, New York, earning almost fabulous sums. He sang there throughout the years of the First World War, proving a tremendous draw. His most popular and characteristic roles were Carlo in *Pagliacci*, Rodolfo in *La Bohème*, the duke in *Rigoletto*, the lover Grioux in *Manon Lescaut*, Edgardo in *Lucia*, and Radames in *Aida*. The gramophone records of his voice are known the world over, and brought him a colossal income. His voice was singularly free from strain and reached top notes of rare power and virility, yet always velvety and sympathetic. He married Dorothy Park Benjamin in 1918. Ruptured a blood vessel in his throat while singing in 1920, and as the result of ensuing complications he d. in Naples the following year. See Dorothy Caruso, *Enrico Caruso*, 1946.

Carutti, Domenico, Baron of Cantogno (1821-1909), It. diplomat and historian, first attained distinction as the author of

many valuable historical works, including *Political Essays, Principles of Free Governments*, and hist. of Victor Amadeus II. and Charles Emmanuel III., the first and second kings of Sardinia. His public advancement was continuous from his secretaryship in 1800-61 to the post of minister for foreign affairs under Cavour. In the same year he entered Parliament, and from 1862 to 1869 acted as plenipotentiary at Amsterdam. In 1869 he became Privy Councillor, and from that time he contributed to many historical reviews, and completed (1875-80) his exhaustive *History of the Diplomacy of the House of Savoy*.

Carvacrol, phenolic liquid. Formula $C_{11}H_{10}O$, boiling point 236° . It occurs in the essential oil of *Origanum majoranoides* (the sweet majoram of Cyprus), but is generally obtained by heating carvone with phosphoric acid.

Carvajal, Tomas Jose Gonzalez (1753-1834), Sp. statesman, attracted considerable attention by the marked aptitude he showed for finance, and from 1790 held many financial appointments, until in 1813 he rose to become secretary of state. Eight years later he became a member of the Privy Council, and in 1833 served on the great Council of War. He has a further claim to distinction as the author of *Los Salmos* (1775).

Carvel (for *caravel*, from Gk. *καράβος*, a light ship, through It. *carabella*): 1. Has been used in different countries of very various ships. Columbus discovered America in a caravel, that is a roundish galley-rigged vessel, with three towers on deck. The Fr. use C. for a herring-boat; the Turks for a man-of-war. 'C. built' is applied to a boat 'whose planking is flush with edges laid side to side' as distinct from 'clinker built'. 2. Is used in Manx and Breton literature as a synonym for carol or ballad. Originally it always referred to a lyric set to some dance measure.

Carver, George Washington (1860-1940), Amer. Negro chemurgist and agric. experimenter. B. of slave parentage in Missouri, he none the less succeeded in taking the degree of Master of Science at the Iowa State College, working there as a botanist until 1896, when he went to the Tuskegee Institute, in Alabama. He spent his life in agric. research for the betterment of the S. and of his people. Persuading farmers to vary their crops by planting soil-enriching peanuts and sweet potatoes instead of soil-exhausting cotton, he next solved the problem of finding new uses for these crops, which had become over-abundant as food-stuffs. From the peanut he made cheese, flour, coffee, milk, dyes, ink, soap, etc. From the sweet potato came flour, vinegar, molasses, rubber, etc. Years before plastics from wood waste were first attempted, C. was making synthetic marble from wood shavings. In 1940 he gave his life savings of \$33,000 to establish the C. Foundation to carry on his research. See R. Holt, *George Washington Carver*, 1947.

Carver, John (c. 1575-1621), Pilgrim Father who emigrated to America in the

famous *Mayflower*, and was appointed the first governor of the sturdy Plymouth colony (1620-21). He had taken refuge at Leyden about 1607 as the result of religious persecution in England.

Carver, Jonathan (1710-80), Brit. traveller, served in the Fr. and Indian wars, and after the peace of 1763 set out on a journey of exploration westward. Finally he reached the Mississippi by way of the Fox and Wisconsin Rs., and obtained from the Indians a grant of land between the St. Croix and the Mississippi. Explorer of the country of the Upper Mississippi, he was the first Brit. traveller to visit the falls of St. Anthony (1766). His *Travels through the Interior Parts of North America in the years 1766, 1767, 1768*, was pub. in London in 1778. No narrative of early travel in N. America has ever outtrivalled the popularity of this work. C., however, was in serious financial straits and this success came too late to relieve his poverty. The sequel or second part of his work described the manners and customs of the Indians, but it is little more than a paraphrase of earlier Fr. accounts and even C.'s authorship has been questioned. This plagiarism in the second part and occasional falsification in the first, however, do not seem to justify doubts on the main facts of the first part of his work, for his original *Journal* or journals, now in the Brit. Museum, fully bear these out.

Carvin, tn. to the N. of the dept. of Pas-de-Calais, France, 10½ m. S.W. of Lille. It has coal mines, and beet, brandy, etc., manufs. Pop. 19,500.

Carving, one of the oldest means of decoration and artistic expression. The word denotes cutting (A.-S. *carfan*; Gk. *γρᾶφειν*), and differs from mere draughtsmanship in that it secures relief and durability by incisions into the material and by the modelling of its surfaces. C. is thus a general term, and may be applied to sculptural work in wood, ivory, precious stones, terra-cotta, stone, marble, clay, wax, etc., but the C. in the first material only will be dealt with in the present article. Oak, on account of its durability, is the most suitable wood for C.; mahogany, teak, chestnut, and Amer. walnut produce good work, whilst lime, sycamore, and the barks of fruit trees are employed for fine work. The fact that the fibres of wood run in a vertical direction and are deficient in lateral cohesion limits the scope of the carver. In all delicate work, such as tendrils or thin stems, the wise artist will take care to follow the grain instead of drawing across it; otherwise his detail will, in course of time, break away. The carver's kit consists of chisels for drawing lines, gouges for making hollows, etc., the 'V' tool for veining, and a mallet. Commercially many mechanical devices are in use for cheapening and lightening his work. Thus in the case of fretted or scroll work the ornament is glued on the ground after being cut with a fret saw. This method often produces unsatisfactory work, as the two woods, being differently affected by the atmosphere, tend to

separate. Another machine has a revolving drill which is directed over the ground of the decoration, whilst what is called the C. machine has a number of drills moving over the surface to be carved in accordance with a tracing point which works over the ground of an iron model of the required design. After fixing his piece of wood to a bench the workman sketches or traces his drawing. Then he grounds out the spaces between the lines with his gouge. The next process of 'bosting' consists in shaping and modelling the details of his pattern, and finally he must clean up the whole. The success of his work largely depends on his appreciation of the appropriate relativity of light and shade. C. is one of the most primitive and popular forms of ornamentation. Among savages to-day there is often a just appreciation of the effective contrast of plain with decorated surface. They apply their skill to various objects. Thus the Ijoss of the Niger adorn their paddles, the Kaffirs their spoon handles, and the N. Amer. Indian his wooden pipe stem or fish hook. The Egyptians from earliest times carved the faces of the dead in their mummy cases, and in the Cairo Museum is the statue of an elderly man, carved from a solid block of sycamore, which goes back probably to 4000 B.C., and as a work of realism has never been surpassed in that country. In Greece the earliest sculptors worked in wood, and for a long time their *éssava*, or images of the gods, were religiously preserved. In Europe there are two great periods of C., the Gothic (twelfth to fifteenth centuries), and the Renaissance (sixteenth to seventeenth centuries), but of the two the former produced work immeasurably superior. In the Gothic period the wood carver was a master craftsman, who travelled with his hand from church to church. He was actuated by high religious and social ideals, and was encouraged to respect the dignity of his craft by the prominence given to it in all church decoration. Thus pulpits, choir stalls, roofs, rood screens, font-covers, lecterns, doors, and retables all owed much of their beauty to his skill. For the splendour of his architectural imagination, for the patient minuteness and accuracy of his detail, and for his loving and faithful imitation of natural forms, the Gothic workman is unsurpassed. The endless and fascinating diversity of treatment was due to the free play given to individual carvers, whilst the splendid richness of Gothic work owed not a little to their harmonious colour schemes of blues, reds, greens, golds, etc. The magnificent roof of Westminster Hall and the elaborate pinnacled and canopied choir stalls of the abbey both belong to this period. Italy is the true home of Renaissance work, and contains perhaps the finest illustrations. But, speaking generally, this period is characterised by failure to grasp the essentials of true composition by an increase in dexterity and high finish at the expense of artistic principles, and by brainless extravagance in detail and tasteless over-elaboration.

The most representative examples of Renaissance C., which is more ornate than Gothic, may be found in domestic work, and especially in oak chests, cupboard doors, mantelpieces, etc. Conventional leaves and patterns were substituted for the beautiful vine, oak, maple, and acanthus foliage of the earlier epoch. The great school of Grinling Gibbons, whose work can be seen at Hampton Court, Chatsworth, etc., dominated the seventeenth and eighteenth centuries in England. Yet the very flamboyance and profusion of his art detract from its obvious excellence in technical dexterity. It is certain that he is unequalled in the skill with which he carved drapery out of lime wood and modelled flowers, birds, fruit, foliage, etc., in the highest relief. In modern times the art of C. has fallen on evil days, but the decline in the art is due rather to the diminished demand for such costly ornament—costly in comparison with rival mechanical decorations—than to any assured decrease in the amount of talent available. The mosques of the Moslem world and also the Hindu temples of India contain some of the most intricate and delicate wood work. The Arab worker knew well how to combine foliage and geometrical designs, and to introduce animals and figures, and was possessed, above all, of unlimited patience, as the labyrinths of elaborate joinery on his screens alone suffice to show. Lack of restraint often spoils the effect of what is otherwise magnificent Indian C. The Hindu, however, has realised better than any other the value of the circle in ornament, just as the Jap. has best reproduced the lotus and water-lily, and as the Chinaman in all microscopic work has again and again proved his superiority. To-day there has been a revival of C. and sculptures as decorations on buildings as may be exemplified in the buildings of the Architectural Association. See H. A. Tappin, *Grinling Gibbons and the Woodwork of his Age*, 1914; T. J. Beveridge, *English Renaissance Woodwork, 1600-1730*, 1924; A. Vallance, *English Church Screens*, 1936.

Carvone, terpenic ketone. Chemical formula, $C_{10}H_{16}O$. Boiling point 230° at 755 mm. It occurs in caraway oil and in other essential oils. On heating with acids it isomerises into carvacrol (*q.v.*), but with aqueous acids it forms a hydrate.

Cary, Henry Francis (1772-1844), b. at Gibraltar, educated at Rugby, Sutton Coldfield, Birmingham, and Oxford; ordained 1796. Pub. his dignified trans. of the *Divina Commedia* in 1814, and afterwards trans. Pindar's *Odes* and Aristophanes' *Birds*. Assistant librarian of the Brit. Museum, 1826-37. Buried in Westminster Abbey. Of the four hundred trans. of Dante in Eng. which are said to exist, those by John Carlyle, Philip Henry Wicksteed, and Thomas Okey, in prose, may have superseded C.'s; while Laurence Binyon's rendering into Eng. triple rhyme is unsurpassed in its kind. But C.'s blank verse is still to be preferred to the Spenserian and other forms of some recent rhymed trans.;

and into whatever book of quotations search be made for a Dantesque phrase, it will generally be found to be *C.'s* trans. that is used. Although *C.* used blank verse at the end of a period in which the Miltonic influence had overlaid this medium he succeeded in lending to it sufficient simplicity and flexibility to reflect the tone of Dante's style.

Carya, botanical name of the genus of *N. Amer.* trees which comprehends the various kinds of hickory, in the family Juglandaceae. They are cultivated on account of their hard and elastic wood, which surpasses all other wood as economical fuel, and for the edible fruit called pecans. *C. oliviformis* is a swamp species with a glender stem and delicious hickory-nuts; *C. sulcata* is the thick-shell bark and *C. alba* the white-shell bark.



THE CARYATIDES OF THE ERECHTHEUM, ATHENS

Caryatides (Gk. *Karyatides*, women of *Caryæ*), draped female figures which take the place of pillars in architecture, and are comparable with the *Atlantes* (*q.v.*), or male figures, of the same function. The most celebrated examples are those of the Erechtheum at Athens, as in the illustration, of which the *C.* of St. Pancras Church, facing Euston Road in London, are reproductions.

Caryocar, one of the two genera of *Caryocaraceae*, or *Rhizophoraceae*, is peculiar to tropical America, and is noted for its fruit. The wood is very durable and is used in ship-building; it is reddish, hard, and compact. *C. nuciferum* yields the suwarrow, or sours, nuts of commerce, and *C. butyrosa* the butter-nuts, which contain a thick oily substance.

Caryophyllaceae, large family of cosmo-

politan *Dicotyledons*, many species of which occur in Britain; they have no economic use, but are often cultivated on account of their pretty flower. The inflorescence is a dichasial cyme. The flowers are polypetalous and hypogynous, with usually five free or joined sepals, five petals, twice as many stamens, a syncarpous gynoeceum with two to five carpels, a unilocular ovary with free central placentation. The opposite leaves and swollen nodes are characteristic of this order. *Lychnis*, which includes corncockle, ragged robin, and red campion; *Dianthus*, which includes the carnation and sweet-william; and *Stellaria*, which includes chickweed and stitchwort, are three of the chief genera. *Gypsophila* is often used in floral decorations.

Caryophyllus aromaticus, or *Eugenia caryophyllata*, species of *Myrtaceae* which grows in the tropics as a small evergreen shrub; the flower-buds of the plant are gathered before they are open, dried in the sun, and sold in the well-known form of cloves (*q.v.*).

Caryopsis, syncarpous fruit, usually composed of two carpels and having a dry closely attached pericarp, as seen in grass seeds and oats.

Caryota, genus of *Palmaceae*, some of the species of which grow to a height of 60 ft. in the *E. Indies*. The leaves are bipinnate, and the shape of the leaves has given the genus the name of fish-tail palms. The large green or purple flowers grow in groups of three, one female between two males, and the fruit is a berry. *C. urens*, the wine-palm, is the best known species; it is noted for the peculiarity of producing a burning sensation to the skin when the pulp is applied to it. The wounded flowers exude an enormous amount of juice, from which toddy and jaggery, a kind of sugar, are obtained. The leaf-stalks are made into fishing-rods, and their fibres into ropes; the trunk yields a wholesome starch used as food.

Casablanca, Louis de (1755-98). Fr. naval officer b. in Corsica. He was mortally wounded at the battle of the Nile, and went down with his son, who refused to leave him, in his ship when it caught fire. Mrs. Hemans and André Chénier have celebrated him in their poems.

Casablanca, or *Dar-el-Beida*, seaport tn. on W. coast of Morocco, with 258,000 inhab., of whom over 40,000 are Europeans. It is the economic centre of Morocco. In 1907 *C.*, a small tn. trading in agric. products, was bombarded and occupied by Fr. troops. There are regular steamers to the ports of W. Europe and air lines to Toulouse and Oran, and railways and motor coaches to the interior. Its varied industries give it the appearance of a rapidly growing European tn. Its trade is more than half that of all the ports of W. Morocco. During the Second World War the tn. was the scene of the *C. Conference* (*q.v.*) between President Roosevelt and Mr. Winston Churchill, accompanied by the combined chiefs of staff (Jan. 14-24, 1943).

Casablanca Conference held on Jan

14-24, 1943, between Mr. Churchill and President Roosevelt, together with their leading political and military advisers, to give precision to the plans for the immediate future of the military activities of the Allies in N. Africa and also to decide on broad strategic plans generally. Stalin was invited to attend but neither came himself nor sent any responsible delegate. Full information of the proceedings was communicated to Moscow, but there were no reciprocal communications which might enable the W. Allies to measure the prospects in Russia in relation to their own plans, and Soviet secretiveness and suspicion remained a further barrier to the full co-ordination of allied efforts. But one of the immediate purposes of the conference was to draw as much of the weight as possible off the hard-pressed Russian armies by engaging the common enemy as heavily as possible at the best selected points. The conference did not conceal the intention of the Allies to make an actual invasion of the Continent of Europe. The conference adopted and pub. a formula regarding peace terms. It was that there must be unconditional surrender, not merely on the part of the dictators (with whom it had previously been declared that the Allies would never negotiate), but on that of the three Axis nations. See **AXIS**. The intention was to exclude the prospect of anything like the Fourteen Points advanced by President Wilson in the First World War, and also to disentitle the enemy nations from claiming any rights under the Atlantic Charter (*q.v.*) of 1941.

Casacalenda, tn. of Italy, in the prov. of Abruzzi e Molise, situated on the Biferno, 40 m. N.W. by W. of Foggia. Pop. 6400.

Casa, Giovanni della (1503-56), It. poet and translator, b. near Florence in the Mugello valley, the son of a great Florentine family. He was made archbishop of Benevento and nuncio at Venice in 1514 by Pope Paul III. While holding these offices he made himself noteworthy by his violent attacks on the Protestants. He was then made secretary of state, a post which he held till his death. His lyrics, letters, and speeches are in a way excellent but he is chiefly known for his little work called *Il Galateo, ovvero de' Costumi*, which he wrote between 1551 and 1555. This book, with Castiglione's *Cortegiano*, gives a splendid portrayal of the manners at court at the time of the It. Renaissance. Forcellini's ed. of the *Opere*, 1752, is the best. He trans. Plato and Aristotle and compiled sev. biographies. Sev. of his poems were notoriously licentious, e.g. *Capitoli del foro*; but he is noted for being the leader of a reaction in lyric verse against the prevalent imitation of Petrarch.

Casale (anct. Bodincomagus?), city of N. Italy, on the r. b. of the Po. It was long an important stronghold, and still maintains its fortifications. In 1474 created cap. of the marquisate of Montferrat. Is the seat of a bishop, and contains a venerable cathedral, interesting churches, the Torre del Grand' Orologio,

and some fine palazzi. Leading industries: manufs. of silk, lime, and cement. Pop. 20,000; com., 35,000.

Casalmaggiore, tn. of Italy, in the prov. of Cremona, situated on the It. Po. The manuf. of glass, pottery, and cream of tartar is carried on. There are numerous fine buildings, including an abbey, hospital, custom-house, etc. Pop. 4210.

Casalpusterlengo, tn. of Italy, in the prov. of Milan, situated on the R. Brembiola. There are manufs. of silk, linen, and earthenware, also a trade in Parmesan cheese. Pop. 5000.

Casals, Pablo (b. 1876). Sp. cellist and conductor, b. at Vendrell near Barcelona. Educated at Barcelona and Madrid Conservatoire. First public appearance in England was at Crystal Palace, 1898, and in Paris the same year, since when his playing gained him international fame. In 1906 he married Guilhermina Suggia, the Portuguese cellist (*q.v.*), and in 1914 Susan Metcalfe, Amer. singer. He founded the Pau Casals Symphony Orchestra of Barcelona in 1920 and was its conductor. He was made Citizen of Honour of Madrid in 1935 and Member of Honour of the Sp. Academy the same year. He has received many international awards and distinctions, and has pub. symphonic and choral works and chamber music.

Casamance, riv. in the W. of Africa in the Fr. colony of Senegal. It forms an estuary which enters the sea in about 12° 30' N.

Casamassima, tn. in Apulia, Italy, 14 m. from Bari. Pop. 8500.

Casamicciola, tn. on the is. of Ischia in the gulf of Naples, Italy. Since 1883 it has been entirely rebuilt, as the old tn. was destroyed by an earthquake. Many visitors go there between May and Aug. on account of its hot mineral springs (150° F.). Pop. 3500.

Casanova de Seingalt, Francesco (1730-1805), It. artist. Born in London, but gained his reputation in Paris as a painter of battle pictures and landscapes. His pictures can be seen at Rouen, Nancy, and Lyons.

Casanova de Seingalt, Giovanni Jacopo (1725-98), It. adventurer noted for his wit, accomplishments, and intrigues. He was b. in Venice, brother of Francesco C. (*q.v.*). His father was of old and good family, but owing to his having adopted the theatrical profession, he was alienated from his family. Giovanni's mother was Zanetta Farusi, a shoemaker's daughter. His grandmother had him educated in London beyond his social standing, and at the age of sixteen he entered a seminary at Venice, whence he was expelled for immoral conduct. Through his mother he was given a situation in the household of Cardinal Acquaviva, but as he found it very dull and irksome, he took to travelling. His career of intrigue and hazard led, after wanderings to one cap. after another, often in the most aristocratic society, to his imprisonment in Venice. Escaping from Venice, he was appointed to manage state lotteries in Paris. After further European wander-

ings, embracing England, Poland, and Spain, he returned once more to Venice in the capacity of state spy, and, later, retired to Bohemia. His famous *Memoirs* (1876) throw a strong light on the manner of life he led. See B. Dobrée, *Uicomo Casanova*, 1933.

Casarano, tn. of Italy, in the prov. of Lecce, 10 m. S.E. of Gallipoli. Pop. 7000.

Casas, Bartolomé de Las, see LAS CASAS.

Casas, Ciudad de las, see SAN CRISTOBAL.

Casas Grandes: 1. Ant. city in the state of Chihuahua, Mexico, 130 m. from El Paso. It has ruined buildings erected by Pueblo Indians and discovered in 1660 by the Spaniards. 2. Ruins of a prehistoric city in Pinal co., Arizona, U.S.A., 50 m. from Tucson.

Casaubon, Isaac (1559-1614), Fr. theologian and classical commentator, b. at Geneva, his family having come originally from Dauphiné. At the age of twenty-four he was appointed prof. of Gk. at Geneva, and three years later he married the daughter of the great Fr. scholar, Henri Estienne. Henry Wotton, in the course of his continental tour, lodged with C. at Geneva. In 1596 C. accepted the Gk. professorship at Montpellier, and afterwards he lingered over twelve months at Lyons, awaiting his appointment to a Paris professorship. The univ. of Paris had closed its doors against all but Catholics and Henry IV. dared not appoint a Calvinist. However, he gave a pension to C., with a promise of the royal librarianship when it became vacant, which was not until 1604. After the assassination of Henry, C. was forced to move to London, where he was made prebendary of Canterbury and given a pension. He was unjustly charged, after the pub. of his reply to the *Annals* of Cardinal Baronius, with having sold his conscience in order to gain the favour of James I. The truth was that he had for some time been drawing near to the Anglo-Catholic Church. He devoted his life to classical study, though often hampered in many ways, and he helped to give a connected knowledge of the lives of the ancients. He pub. eds. of Athenaeus, Aristotle, Diogenes Laertius, Theophrastus, Polybius, Theocritus, Persius, Suetonius, etc.; also the treatises *De Satrica Græcorum Poesi et Romanorum Satira* and *De Liberte Ecclesiastica*. C.'s *Correspondence*, in Lat., was collected by van Almeloveen (1709). His diary, *Ephemerides*, ed. by his son Meric (q.v.), is preserved in MS. in the Chapter Library, Canterbury, and was printed by the Clarendon Press, 1850. His life was written by Mark Pattison, 1875.

Casaubon, Meric (1599-1671), son of Isaac C. (q.v.), accompanied his father to England, and was educated at Christ Church College, Oxford. Was made prebendary of Canterbury and vicar of Monkton in Thanet, deprived of his appointments in 1644, but restored in 1660, and eventually became rector of Ickham. He inherited his father's taste for classical research, and vindicated the memory of Isaac C. in two Lat. works. **Casbeck**, see KAZBECK.

Casca, Publius Servilius, tribune of the plebs in Rome in 44 B.C. He was one of the assassins of Caesar. He was killed at the battle of Philippi, 42 B.C.

Cascade, range of mts. in the U.S.A. situated in the N.W., and stretching in a N. to S. direction through the states of Washington, Oregon, and N. California. It is composed of granite in N. Washington, but all the remaining part is volcanic, covered many times over with flows of lava. The range has either on its crest or sides many extinct volcanoes, such as Shasta in California, rising to 14,392 ft.; Jefferson, 10,350 ft.; and Hood, 11,225 ft., both of which are in Oregon; Adams, 12,470 ft.; St. Helen's 10,000 ft.; Rainier, 14,526 ft.; and Baker, 10,827 ft., in Washington. The general height of the whole range runs from 6000 to 8000 ft.

Cascara Bark, obtained from *Rhamnus purshiana*, the Californian bearberry or buckthorn, which is a N. Amer. species of Rhamnaceæ. The bark is taken from the tree and dried, when it yields a fluid extract, known as *C. sagrada* (sacred bark), which is used as a cathartic.

Cascarilla, which is a S. Amer. genus of Rubiaceæ, is noted for its bark, which resembles that of cinchona, and is used as a valuable aromatic and tonic. It arrives in Europe in short, thin, brittle rolls, and so receives its name, which signifies little bark. The bark of *Croton C.*, a species of Euphorbiaceæ, is known as *C. bark*, and is used as a tonic.

Cascina, com. in Tuscany, Italy, on the R. Arno, in the prov. of Pisa. Cotton, linen, soap, and silk are its industries. In 1364 the Florentine soldiers defeated those of Pisa here. Pop. 27,000.

Case, in grammar, one of the forms of declension to which nouns, pronouns, and adjectives are subject. Means literally a falling, and was so applied because the subject of a sentence had to be imagined as an upright line, with the other words falling away from it. The Eng. language contains only the genitive and some trace of the dative (as in 'whilom', 'seldom'); Lat. has six, nominative, genitive, dative, accusative, vocative, and ablative; Gk. has no ablative; Sanskrit has two additional Cs., locative and instrumental. Eng., Fr., and It. nouns and adjectives have lost their C.-endings, but their pronouns are still modified, while polysynthetic languages (as Finnish and Magyar) acquire very many.

Case, Action upon the, obsolete name for one of the forms of action into which remedies for civil injuries were classified by the common law (q.v.) of England. In the early days of Eng. common law the remedies for civil injuries were few and rigid. Hence the chancellor and his subordinates, who had control of the office out of which writs were issued, initiated in right of an assumed equitable (see EQUITY) jurisdiction, the practice of formulating writs to meet Cs. unprovided for by the common law. This practice at length received legislative sanction in the Statute of Westminster, which permitted actions to be framed in *consimili casu*, i.e. by analogy to

similar Cs. or sets of circumstances for which there already existed a stereotyped form of action or writ. Hence the term actions in *constitut casu* or, more shortly, 'actions on the C.' The common law readers subsequently exercised considerable ingenuity in extending the action upon the C. to meet all manner of Cs. bearing some analogy to existing forms. By the Judicature Act, 1873, all the old forms of action were abolished and no set style of pleading is now required at all, provided the plaintiff shows in his pleadings that the facts come within some legal principle. The fundamental importance of the evolution of forms of action out of actions upon the C. lies in the development of new and more equitable principles of law.

Case of Impositions, The, see BATES'S CASE.

Case, Thomas (1844-1925), Eng. philosophical writer, educated at Rugby and Oxford. In 1883 he was appointed lecturer in Gk. hist. at Christ Church, and in 1889 he was elected to the Waynflete chair of moral and metaphysical philosophy. His publications on philosophy, which are characterised by profundity allied with the spirit of Heraclitus, include *Physical Realism* (1886), *Metaphysics, Aristotle, and Logic*.

Case-hardening. In some parts of machinery toughness of material must be accompanied by durability of surface. These two conditions are satisfied by using wrought iron and transforming its external parts into steel. Such material is used for axles, pins, links, and the edges of cutters, the result being greater accuracy and durability. The piece is generally finished bright, and then heated up according to requirements with its surface in contact with leather, bones, or other charcoal or potassium cyanide, all means of causing the absorption of carbon to a small distance in the iron and the consequent formation of steel. Quenching in water produces the required hardness of surface. Such surfaces must be ground, since common cutting tools will not touch them.

Casein is a proteid, an important constituent of milk and the prin. one of cheese. From the former it is precipitated by means of rennet, which is an extract from the mucous membrane of the fourth stomach of a milk-fed calf. It is a valuable food product containing phosphates. It is also precipitated by mineral acids, but is not coagulated by heat. It is allied to albumen and also to legumin found in the seeds of leguminous plants such as peas and beans.

Casella, Alfredo (1883-1947), It. pianist and composer, b. at Turin, son of a teacher at the liceo there. He studied at the Paris Conservatory under Diémer (pianoforte) and Fauré (composition). He then toured successfully as a pianist and orchestral conductor. From 1912 he directed popular concerts at the Trocadero, Paris. In 1917 he founded in Rome the Società Nazionale di Musica (afterwards Società Italiana di Musica Moderna); refounded, in 1923, as the Corporazione

delle Musiche Nuove (It. section of the International Society for Contemporary Music). The various influences of Debussy, Schönberg, Stravinsky, Itavel, and other moderns may be recognised in all his works. In his compositions he may be classified as an anti-romantic, for his hope was to see his contemporaries in Italy abandon 'vocal melodramatic melody' for 'true music.' Works include *Courant sur l'eau* (ballet), *Pagine di guerra*, *L'Adieu à la vie*, and *Elegia eroica*—all to poems of Tagore; *A notte alla* (piano concerto), cello sonatas, symphonies, chamber music, etc.

Casemate (perhaps from It. *casa*, a house, and *matto*, mad, used in the sense of Eng. 'dummy,' or, perhaps, from Gk. *Khásmata*, pl. of *Khásmá*, gulf, loop-hole gallery or caponier, under the protection of which the garrison of a fort may fire upon the enemy below. Cs. are utilised to protect guns, hospitals, stores, etc., from high-angle or vertical fire; or they may be used as barracks. In architecture, a hollow moulding, such as the cavetto.

Casement, term applied to the wooden frame with a hinge which keeps the glass of a window in position. The earliest windows were all casemented or hinged; the block and pulley system is comparatively modern.

Casement, Sir Roger David (1864-1916), Irish rebel, b. at Kingstown, co. Dublin; younger son of Capt. Roger C. of Ballymena, co. Antrim. Became travelling commissioner to the Niger Coast Protectorate, 1892; in 1895 Brit. consul at Lourenço Marques, in 1898 at Loanda and then at Roma (Congo Free State). Reported Dec. 11, 1903, on the cruelties in the rubber plantations of the Upper Congo. Next, held consular posts in S. America, and in 1910 he made a report, not pub. till 1912, on the inhumanities on the rubber stations on the Putumayo R. in Peru. Knighted 1911; retired to Ireland 1913. He went to Berlin in Nov. 1914, soon after the outbreak of the First World War. In April 1916 he set out for Ireland in a Ger. submarine but on landing at Banna, Kerry, was arrested. Tried in London for high treason June 26-29, and, previously degraded from all his honours, was received into the Church of Rome and hanged at Pentonville, Aug. 3, 1916. In recent years the Eiro Gov. has asked vainly for the return of his remains to Ireland. See G. de C. Parminter, *Roger Casement*, 1936.

Casentino, name given to the valley of the upper Arno in the prov. of Arezzo, Italy. Tourists frequent it as the scenery is very picturesque. It was celebrated by Dante.

Caserta: 1. Prov. of Italy which up to the year 1871 was called Terra di Lavoro. It forms part of Campania, and stretches from the S. Apennines to the Tyrrhenian Sea. Although very mountainous, it is very fertile, and much wheat, olives, forage crops, fruit, and wine are grown there. Timber and marble are also got from this country. Its area is

2033 sq. m., and the pop. 797,000. 2. Cap. of above prov. and episcopal see. There are large silk works here. The royal palace was lightly hit in sev. places in the Second World War, and, being continuously used as the allied headquarters, considerable damage was done in the earlier stages of the occupation to the period furnishings and fittings. Pop. 35,000.

Case-shot, or **Canister**, is a projectile of artillery, designed for use at close quarters. A tin or sheet-iron cylinder is filled with bullets, varying in number and weight from $\frac{1}{4}$ oz. to 1 lb., the interstices between which are closed with sawdust. When this is fired it immediately breaks, scattering the balls considerable distances. As their velocity is small, they are ineffectual at a greater range than 300 yds.

Cash, denotes primarily ready money, money in a bank, in a chest, strongbox, or coffer; but since the institution of banks it has come to denote also bank-notes, cheques, money orders, and other documents containing an order to pay on demand as opposed to bills of exchange or other credit instruments (see also CURRENCY).

Cash Credit. A C. C. is simply an advance by way of a debit balance in current account, which advance is secured to the bank by a bond entered into by a couple of solvent parties who are guarantors for the borrower. It was a system invented in 1729 by the Royal Brit. Bank (which, though not strictly a Scottish bank, was promoted by Scotsmen with the object of transplanting to Eng. soil the peculiar system of Scottish banking), designed to get its superfluous capital into circulation by inducing parties to borrow and embark in business. It is unanimously acknowledged that the system, now general among bankers, has been of immense advantage to the country materially and morally.

Cash on Delivery System is an arrangement whereby the postal authorities, railway companies, and other common carriers undertake on behalf of the vendor to collect the price of goods delivered by them from the recipient and to transmit the money to the vendor. This system is highly popular in most European countries and in India and Japan, but, except as between the United Kingdom and certain Brit. possessions and Egypt, the system was not, until 1926, introduced into England, owing to the apprehensions of local retail traders. In the face of a long trial as between the United Kingdom and certain colonies and between the United Kingdom and European countries, these fears disappeared, and in 1926 the inland C.O.D. service, limited to parcel post, was introduced, with such successful results that in 1928 the system was extended to packets sent by registered letter post as well as to goods sent by rail to any part of Great Britain. By this service a sum (the trade charge) up to £40 can, under certain conditions, be collected from the addressee and remitted to the sender of a packet or parcel or

registered letter at a money order office or a parcel consigned by rail. Fees: for trade charge or value up to 10s., a fee of 4d.; up to £1, 6d., 2d., 8d., 2s., 10d., and for each further £5 or less, 2d., by rail 3d. extra. The fees charged in the United Kingdom on C.O.D. packets from abroad are from 4d. when the trade charge is not over £1, with 2d. extra for each additional £1 of trade charge up to the maximum, which is usually £40 (the fee for the collection of which would be 8s. 6d.), but to some countries is less. If trade charge cannot be collected, the rules for undeliverable parcels apply.

Cashel, Tipperary, Eire, the see of a Rom. Catholic archbishop and of a Church of Ireland bishop. Built on the S. slopes of a great height (the Rock of C.), it was the stronghold of the anct. kings of Munster, and contains many interesting ruins, a stone-roofed chapel built by Cormac McCarthy, 1127, a cathedral founded 1169, the palace of the Munster kings, etc. Dean Swift, the author of *Gulliver's Travels*, was born here. Pop. 3000.

Cashew Nut, or *Anacardium occidentale*, species of *Anacardiaceae* which is largely cultivated in tropical America. The fruit is a kidney-shaped nut with a hard shell containing an acrid black juice, but when this has been removed the kernel is found to be oily, pleasant, and wholesome. It is usually roasted for eating, and is often put into old Madeira wine in the W. Indies to improve the flavour. It is also prepared commercially as a 'butter'. The fleshy stalk has an agreeable flavour.

Cash Register, calculating machine for use in connection with the C. till of shops, to record the money received. Most are supplied with a number of keys, each representing a particular sum. On pressing these keys, or a combination of them, representing the sum of the purchase, a record is made of the purchase and the amount is also shown to the customer by means of an indicator. There are many elaborations of this idea.

Cashiering (Fr. *casser*, to break), a term in military law denoting the annulment of an officer's commission and his dismissal from the service. It may be awarded by a court martial as a punishment for a number of offences by way of alternative to imprisonment. In the words of the Army Act 'scandalous conduct unbecoming the character of an officer and a gentleman' is met by sentence of C.

Cashmere (India), see KASHMIR.

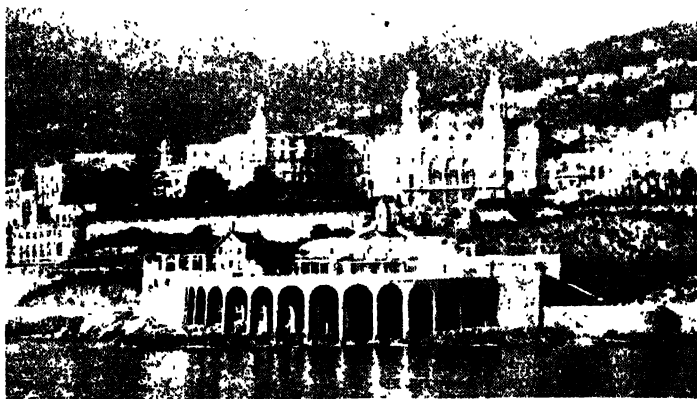
Cashmere, silky woollen fabric originally manufactured from the hair of the Tibetan and Bokhara goats, and woven in C. (Kashmir). The hair is spun by women, afterwards dyed, and made into the famous shawls, one of which requires the wool of seven or more goats. These were sold in Europe at prices varying from £100 to £300, but since 1870 the demand for them has not been so great. Imitations are made in France, and attempts have been made to acclimatise the C. goat in Europe and

the U.S.A. The name is also given to a fine woollen stuff, made in imitation of the shawl fabric.

Cashmere Goat, or *Capra laniger*, variety of the common goat of the ruminant family Bovidae. It occurs in Tibet, Bokhara, and Kirghiz, but attempts to introduce it into other countries have proved unsuccessful. It is a smallish goat, white, black, or brown in colour, with hanging ears, long horns, and long, straight, fine hair. The wool is used chiefly in the manuf. of C. shawls, which are very fine in texture, and have been valued at sev. hundreds of pounds.

Casimir IV. (1427-92) was, by birth, Jagiello, grand duke of Lithuania, but by his marriage with Jadirga, the daughter of Louis, king of Poland and Hungary, united Lithuania and Poland. He waged war against the Teutonic knights, and by the treaty of Thorn recovered from them W. Prussia in 1466. During his reign the aristocracy increased in power, and won special privileges at the diet of Nieszawa (1454).

John Casimir (1618-68) succeeded his brother, Ladislans IV. Brandenburg won her independence in 1657, and the Cossacks rebelled against Poland and



THE CASINO AT MONTE CARLO

(Canadian Pacific)

Casimir (properly **Kasimierz**), name of certain kings of Poland.

Casimir I. (1034-58), succeeded his father Mieczyslaw II. The early part of his reign was disturbed by anarchical plots, and from 1037 to 1040 he was obliged to leave the country. On his recall he recovered Silesia from the Bohemians.

Casimir II., the Just (1177-94), was a popular ruler and sided with the people against the nobles. During his reign the senate, composed of bishops, palatines, and castellans, was estab.

Casimir III., the Great (1333-70), was b. in 1310. He added Red Russia to his dominions (1341), founded the Polish law in the famous Statute of Wislica (1347), and subdued and won the friendship of the Teutonic knights and the Bohemians. He was a democratic ruler, and was, in consequence, called the king of the peasants. He founded the univ. of Cracow (1364), and encouraged friendly commercial relations between Poland and other countries.

finally joined Russia in 1654. Poland also suffered frequent attacks from Sweden and Russia, and C. was obliged to take refuge in Silesia. Poland lost Livonia to Sweden (1660), and the ter. beyond the Dnieper was ceded to Russia (1667). C. abdicated in 1668, and lived in retirement in France till his death in 1672.

Casimir-Périer, Jean Paul Pierre (1847-1907), the fifth president of the Fr. Republic. He was b. in Paris on Nov. 8, and was the grandson of Louis Philippe's famous premier, Casimir Pierre Perier. His first appointment which brought him into public life was that of secretary to his father, who was minister of the interior when Thiers was president. In 1874 he was made general councillor of the Aube, and was, by that dept., sent to the Chamber of Deputies in 1876. In this he was always re-elected until he was made its president in 1893. He was made Prime Minister, but resigned in May 1894, and was then again re-elected president of the Chamber of Deputies. In 1894,

Casper, second largest city in Wyoming, U.S.A., with large oil refineries. Pop. 17,000.

Caspian Sea (anct. *Mare Caspium*, or *Mare Hyrcanum*, Gk. *Kásmia θάλασσα*), the largest inland sea in the world, on the boundary between Europe and Asia, extending from 38° 40' to 47° 20' N. lat., and 46° 50' to 55° 10' E. long. Its length from N. to S. is 680 m., and its breadth varies between 130 and 270 m.; total area 170,000 sq. m. It lies mostly in Russian ter., having Russia and Persia (Iran) on the W., Russia on the N., the Transcaspien prov. on the E., and Persia on the S. The present sea formed part of a vast ocean which probably extended at one time to the Arctic Ocean, and united with the Black Sea in the W. More recently the C. and Aral waters constituted a distinct Aralo-C. Sea, traces of whose existence are the high-level terraces (beaches), which surround part of the C. shore-line, and in deposits of the C. type of fossil shells which are scattered over the Post-Pliocene Karakum sands eastward as far as the meridian of Merv. The coast-line is irregular, the prin. indentations being those of Mortvi Kuitak (W. of the bay of Kaldak), Kenderli, Karabugas, and Balkan. The C. has no tides, but its navigation is difficult because of violent storms. Greatest depth in N. basin, 2526 ft., and in S., 3006 ft. Its chief tribs. are the Volga, Ural, Emba, Terek, Kura, and Atrak Rs. Communication with the Black, Baltic, and White Seas has been estab. by means of canals connecting with the Volga. It abounds in fish, notably salmon and sturgeon, which also supply the caviare and isinglass manufactories on its shores. Many lines of steamers navigate the C., the chief ports being Astrakhan, Baku, Gurev, Derbent, Petrovsk, Lenkoran, Krasnovodsk, Ilych, and Tschikishliar in Russian ter., Astara, Meshed-i-Sar, Lahlevi, and Bandar-i-Gaz in Persia.

Casquets, see **Caskets**.

Cass, Lewis (1782-1866), Amer. statesman, b. at Exeter, New Hampshire. He entered the army in 1813, and in due course rose to the rank of general. For sev. years he was governor of Michigan and in the year 1831 was made minister of war. For a long period he was a senator, and in 1857 he obtained the position of secretary of state, which he held until 1860. Democratic candidate for President in 1848, he was beaten by Gen. Taylor. He wrote a hist. of the traditions and language of the Indians of the U.S.A.

Cassagnac, Bernard Adolphe Granier de (1806-80), Fr. journalist, b. at Avéron-Bergelle in the dept. of Gers. He started his career in Paris in 1832, writing various papers defences of Romanticism and Conservatism, and his ardent defence of Guizot brought him not a little notoriety, and was the cause of many duels. In 1840 he went to the Antilles, peard while there married a Creole, Mile Cracovallon. In 1852 he was elected to commedial candidature of the dept. of other co. In 1868 he accused the Liberal

party of opposing the emperor, and of having received money for that purpose from the king of Prussia, but was unable to produce other than false evidence when called upon to do so. He fled to Belgium in 1870 after the proclamation of the republic, but returned in 1876 for the elections, and was elected deputy.

Cassagnac, Paul Adolphe (1843-1904), son of Bernard Adolphe C., in early life was associated with his father in politics and in journalism. He joined the fighting ranks upon the declaration of war in 1870, was taken prisoner at Sedan, and imprisoned for some time in a fortress in Silesia. From there he returned to Paris in 1872, once more associated himself with *Le Pays*, the journal of which his father was editor, and therein ardently upheld the Bonapartist cause against the Royalists and Republicans. In 1876 he was elected deputy for the dept. of Gers. His policy was one of strife and obstruction. In 1877 he was again imprisoned, and openly incited MacMahon to rebellion, but the refusal of the latter, and the death of the prince imperial in 1879, ended his hopes in this matter. He was the founder of the journal *L'Autorité*, and wrote a life of Napoleon III.

Cassana, Niccolò, generally called **Nicoletto** (1659-1714), It. painter, b. in Venice. The best of his many fine historical paintings, especially 'The Conspiracy of Catiline,' are in the gallery of Florence. He painted a portrait of Queen Anne of England and of various Eng. noblemen. D. in London. His father, who was a pupil of Strozzi, also painted historical subjects, one of his best pictures being 'St. Jerome' in the Mirandaola church.

Cassander (306-297 B.C.), king of Macedonia, b. 354 B.C., was disinherited by his father Antipater, in favour of Polysperchon. He entered on a struggle with his rival, aided by Ptolemy and Antigonus, gained Athens and other Gk. cities, and invaded Macedonia. He put to death Olympias, mother of Alexander, and also, later on, his widow Roxana, and son Aegus. C. married Thessalonica, half-sister of Alexander, and (316 B.C.) founded the city which bears her name. He also rebuilt Thebes, which had been destroyed by Alexander. His son Philip succeeded him.

Cassandra, the most W. of the three points of the Chalcidice Peninsula, between the gulfs of Salonica and C. In olden times it was named Pallene.

Cassandra, in Gk. mythology, was the daughter of Priam and Hecuba. She was loved by Apollo, who promised to give her the gift of prophecy if she would fulfill his wishes. But on obtaining the promised gift, she refused to carry out her promise. Thereupon Apollo, in revenge, laid upon her the curse that none of her prophecies should be believed. So it was in vain she foretold the fall of Troy, in which she was captured and ravished by Ajax Oileus. She was afterwards murdered by Clytemnestra.

Cassano: 1. Tn. of Calabria, S. Italy,

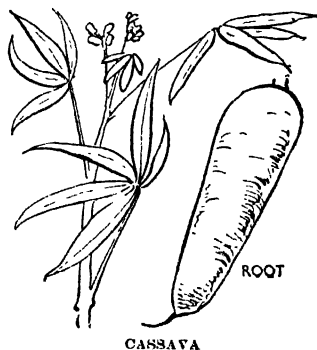
34 m. N. of Cosenza, and 6 m. W. of Sileri. It is well situated, being 820 ft. above sea level. The rock above it is surmounted by an old castle, from which beautiful views are obtained. Warm sulphurous springs are found here. Pop. 8600. 2. Tn. on the R. Adda, Italy. The scene of two battles, one in 1705, when the Fr. defeated the Imperialists, and the other in 1799, in which the Fr. were beaten by the Russians and Austrians. Pop. 9000.

Cassans, tn. in the prov. of Apulia, Italy, 16 m. S.S.W. of Bari. Pop. 6000.

Cassation (*cassare*, in the Lat. of the jurists, to annul, Fr. word denoting the reversal of a judicial sentence.) The Cour de C., which received its full organization under Napoleon, became under the Third Republic the highest tribunal in France. It sits in Paris and hears appeals from all other courts except the administrative courts. It may also receive appeals from courts martial. The court, constituted as the *counsel supérieur* of the magistracy, has power to remove any judge nominated by the president of the republic. It consists of forty-nine members who, by the charter of Louis XVIII., are appointed by the head of the state, but hold office for life. The members include the first president, three sectional presidents and forty-five councillors with a parquet, i.e. ministerial staff, including a *procureur général* and six advocates-general. The court is divided into three sections: (1) Section des Requêtes, which examines whether the petitions or appeals are to be received; (2) Section de C. civile, which decides upon appeals in civil cases; (3) Section de C. criminelle, which decides upon appeals in criminal matters. The court does not decide upon the main question at issue, but only on the competency of the other courts to hear the particular case; and the legality of the forms and soundness of the legal principle by which the case has been already tried. Thus the functions of the Cour de C. are ordinarily restricted to errors of law and procedure, and strictly it is not a court of appeal at all; but in cases where evidence is adduced before it which was not available in the court below, it may send the case back for a new trial or enter the appropriate judgment. This was the course followed in the Dreyfus case in 1906. If the law is found to have been violated, the decision of the inferior court is annulled and the case sent to be tried again by another court. If this second court decides the case in the same manner as the first, and a petition is again laid before the Cour de C., then the three sections unite in order to examine the case anew, and if they in their turn annul the decision, the case is sent to be tried before yet another court. Should this third court decide in the same way as the other courts, and a petition against the decision be again presented to the Cour de C. that court requests a final explanation of the law on the point at issue from the legislature. If the court refuses the demand for a re-hearing its refusal is final. If the court grants the

demand the case is heard by the civil section, where, after the point is argued, annulment is granted or refused. Three judges of the Cour de C., elected for three years by the other judges of the court, are a constituent part of the Tribunal des Conflits. The institution of the Cour de C. proved highly beneficial to France. Placed by the nature of its office out of the immediate influence of political passions it has maintained its reputation for strict impartiality throughout all the changes of gov. and administration. Many of the most distinguished jurists of France are and have been numbered among its members.

Cassatt, Mary (1855-1926), Amer. painter, b. in Pittsburg, Pennsylvania, U.S.A. She went to Spain and afterwards to Paris to study art, where she soon came under the impressionist school of painters. She had her first exhibition of paintings in Paris in 1893, and, after that, for many seasons in Paris and New York. She specialised in painting women and children. Most of her works have found their way into permanent art collections in the big cities of the U.S.A.



Cassava, **Mandioc**, or **Madioc**, the name given to two varieties of *Manihot*, a genus of Euphorbiaceae. The plants are shrubs which grow to a height of about 6 ft. in tropical S. America, and their various products are very valuable. *M. utilisima*, the bitter C., contains a poisonous juice but when it has been driven off the plant is wholesome; the roots are ground to make mandioc or C. meal, also called Brazilian arrowroot, and the poisonous juice, or cassareep, is used as a condiment and preservative. The roots are also specially prepared to make tapioca. *M. Aipi*, the sweet C., has also edible tuberous roots; they are non-poisonous, and are grated directly into food, both for men and cattle. Both varieties are rich in starch.

Cassel, see KASSEL.

Cassel, Sir Ernest (1852-1921), Eng. financier and philanthropist, son of Jacob C., a banker in Cologne, where he received his education. He started life in a corn merchant's office in Liverpool, and upon

leaving there he went to London, where he soon found employment. In 1878, he married Annette, daughter of R. T. Maxwell, who d. in 1881. He financed the great Assuan dam in Egypt, also the Swedish railways, and the Central London tube railway, which was opened in 1900. He raised a loan for China, after the war with Japan, and assisted in the negotiating of three state loans for Mexico. In 1902 he presented to King Edward VII., with whom he had great friendship, £200,000 for the building of sanatoria for consumptives, and in Aug. 1910 he gave another £200,000 for the benefit of poor Eng. people in Germany and the poor Gers. in England. He retired from active business in 1910. When the First World War began, there was an ineffectual agitation against C., to have him removed from the Privy Council, of which he had been sworn in 1902. He was one of the largest subscribers to war loans, and in Sept. 1915 went to America in support of the Anglo-Fr. loan there. He d. at Brook House, Park Lane.

Cassel, Gustav (1866-1945). Swedish economist, educated at Stockholm and Upsala, where he took his doctorate in mathematics. Became prof. of political economy at Stockholm Univ. in 1904. Member of the gold delegation of the League of Nations, 1929-32 and, in 1933, Swedish delegate to the monetary and economic conference in London. He was an outstanding figure in economic science during the inter-war period, playing an important part in interpreting the abnormal monetary phenomena of the years between the wars. His *Theory of Social Economy* (1923) ranks as an outstanding work on economic theory, but he was first and foremost a monetary specialist, and was the leading theoretical expert on foreign exchange during the chaotic period after 1918. After 1911 he advanced the theory that under a system of inconvertible paper currencies the exchange rates tend to represent the ratio between the internal price levels of the countries concerned; in other words, they tend to adjust themselves towards what he called their 'purchasing power parities.' This conception was regarded as almost revolutionary in face of the old theory according to which exchange rates are determined by the trade balance; but he lived to see the general acceptance of his principle. Other works: *Money and Foreign Exchange after 1914* (1922); *The Downfall of the Gold Standard* (1936).

Cassel, John (1817-65). Eng. publisher, who founded the publishing firm Cassell & Co., was the son of an innkeeper at Manchester, and had only a poor education, but during his apprenticeship to a joiner, he contrived to gain much knowledge of Eng. literature and the Fr. language. In 1836 he came to London to work at his trade, but at this time his interests were mostly centred in the temperance cause. In 1847 he became a tea and coffee merchant, but soon gave up the business, and became an author and publisher. His chief ambition was to

supply good reading matter for the working class. In 1859 he entered into partnership with Messrs. Petter and Galpin, and in time numerous eds. of standard works were issued, also the well-known *Working Man's Friend*, *Family Paper*, and *Popular Educator*.

Cassia, genus of Leguminosae consisting of about 400 shrubs, trees, and herbaceous plants found in Asia, Africa, and America. The leaves are paripinnate, the flowers zygomorphic, some of the stamens are often reduced to staminodes or absent, and the pods have often a bitter, nauseous taste. Many of the species contain purgative properties, and yield the drug called senna, obtained either from the leaves or from the pulp of the fruit. *C. Fistula*, the purging C. or pudding-pipe tree, is a small tree with large yellow flowers, in long racemes, having the appearance of a laburnum, and is found wild in India and tropical Africa. This plant yields the C. pods or purging C. of commerce; *C. acutifolia* and *C. angustifolia* yield the senna sold by chemists. *C. lanceolata*, the Alexandrian senna-plant, is found wild in Arabia, whence it is exported under the name senna of Mecca. *C. Mirlandica*, the Maryland senna-plant, is valued for the purgative properties of its leaves.

Cassia Buds, believed to be the immature fruits of *Cinnamomum Cassia*, which yields the aromatic C. bark used in the adulteration of cinnamon. In appearance they resemble cloves and in taste cinnamon, for which spice they are often used in confectionery.

Cassia, Via, one of the highways of auct. Italy. It led from Rome through Etruria to Florentia (Florence) and by way of Arretium and Luca (both in Etruria) and it deviated from the Via Flaminia just after crossing the Tiber. Though the date of its construction and the origin of its name are unknown, it was evidently a well-known road in Cicero's time (see *Philippics*). In the *Antonine Itinerary* it is confused with the Via Clodia.

Cassianus Bassus, Gk. writer of the sixth century, to whom have been ascribed *Geponika*, agric. treatises on rural economy (see *GEOPONICI*). An ed. with notes and index was pub. by N. Nicola at Leipzig in 1781. According to Seyffert, however, he was a Bithynian who lived about the middle of the twelfth century A.D. and undertook the work at the suggestion of Constantine VII.

Cassianus, Joannes Eremita, or **Joannes Massiliensis** (c. 360-448), monk and theologian, one of the first founders of monasteries in W. Europe. He was probably born in Provence, but spent his early life in a monastery at Bethlehem. With his friend Germanus he went to Egypt, Constantinople, and Marseilles, at which place he founded two religious houses, one a convent for nuns, and the other the abbey of St. Victor, which is said to have sheltered 5000 inmates during his lifetime. After his death he was canonised, and for a long time a festival was held at a certain season in his

honour at Marseilles. He opposed the doctrine of original sin in mankind. He wrote *De Institutione Coenobiorum*, and *Collationes Patrum*, treatises on monastic life.

Cassicus, genus of passeriform birds of the family Icteridae, of which belong the Amer. orioles, or starlings. The species are distinguished chiefly by their long, straight, large, and sharply pointed bills. They are gregarious and feed on insects and fruit.

Cassidaria, genus of gastropod molluscs allied to *Cassia*, the helmet-shell. The species are found in the Mediterranean.

Cassides, group of coleopterous insects of the family Chrysomelidae, are often known as shield- or tortoise-beetles from their habit of withdrawing the head into the thorax. They are smallish, oval in shape, brightly coloured, and often metallic in appearance. The larvæ cover their bodies with dried excrement, so as to take from themselves all semblance of insects, e.g. some look like a tiny nest and some seem covered with lichen.

Cassini, name of an It. family of astronomers and geographers, of whom four generations had charge of the observatory at Paris.

Giovanni Domenico Cassini (1625-1712) was b. at Perinaldo near Nice, and studied at the Jesuits' college, Genoa. In 1650 he was nominated prof. of astronomy at Bologna Univ. In 1657 he was made inspector of fortifications by Pope Alexander VII., and in 1669 he was made director of Paris Observatory. He determined the rotation periods of Jupiter, Venus, and Mars, discovered four of Saturn's satellites, and the div. of that planet's rings, etc.

Jacques Cassini (1677-1756), son of the former, was b. at Paris, and at the age of seventeen was admitted as member of the Academy of Sciences. Two years later he was made fellow of the Royal Society of London. In 1712 he succeeded to his father's position, and pursued various researches on the figure of the earth.

César François Cassini, de Thury (1714-84), son of the preceding, was b. in Paris, and succeeded to his father's position. He also continued the latter's surveying operations. He began the great topographical map of France, which was later completed by his son:

Jacques Dominique, Comte de Cassini (1748-1845), who also took an active part in the div. of France into depts. He helped to found the Institute.

Cassini's Ovals, see OVALS.

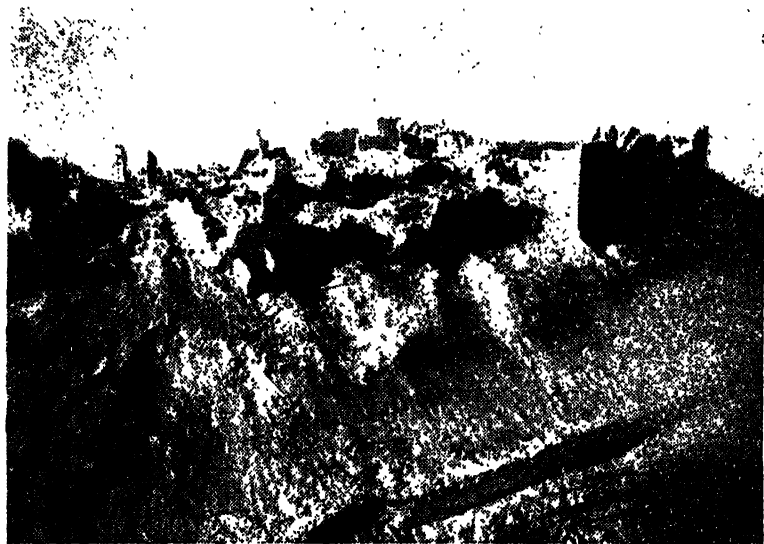
Cassino, tn., only a few jagged ruins of which now remain, in the prov. of Caserta, Italy, about midway between Rome and Naples. These remains are on the site of the anct. Casinum, which the Romans colonised about 312 B.C. In the tn. as it stood before 1944 were the ruins of a Roman amphitheatre and many other old buildings. On a hill behind, 1700 ft. high, stood a famous old Benedictine monastery known as Monte C., founded by St. Benedict in 529. The site of the monastery was chosen by St. Benedict with a

view to defence against barbarian assault. The monastery was destroyed four times before 1944: in 589 by the Longobards; in 884 by the Saracens; in 1030 by the Romans; and in 1349 by earthquake. In 1866 it was dissolved, but some of the monks stayed on till almost the end. Its church possessed an eleventh-century Byzantine bronze doorway, also valuable frescoes, mosaics, and pictures. In the monastery was a theological seminary, a picture gallery, and a library of 40,000 vols. The pop. of C. was 19,000 before the Second World War. Nothing but a few walls and rubble of C. survived the Allies' bombing in 1944. The allied air forces, on March 15, 1944, dropped some 1400 tons of bombs on the tn. Thereupon ensued a protracted struggle for the ruins. The monastery had been previously attacked by the Allies as soon as it was established that the Germans were using it as a fortress (see CASSINO, BATTLE OF). It was not, however, completely razed to the ground, for the W. end survived as far as the top-storey. The old tower at the S.W. corner lost its upper floors. But the great stairway was pulverised and the cloister of the Benefactors was destroyed. Except for remains of piers, the basilica was demolished, as also the cloister of the Prior, and the entire E. end was destroyed to the ground floor. But all the movable contents had been sent to Rome, including the contents of the library, which went to the Vatican. The rebuilding of the monastery started after the war.

Cassino, Battle of (Feb.-May, 1944), protracted battle for the tn. of C. and the Benedictine monastery known as Monte C., fought by the Fifth Army of Amer., Brit., and Fr. troops and, later, also by troops of the Brit. Eighth Army and some Polish troops, against the German forces under Marshal von Kesselring, in the course of the allied invasion of Italy during the Second World War. The site of the famous Benedictine monastery or abbey, Monte C. and the tn. of C. and its surrounding heights, have provided a standard example of defence in It. military text-books for more than eighty years before the battles of 1944. The Allies, having on Feb. 1 crossed the Rapido R., Amer. and Fr. colonial troops of the Fifth Army broke through the Ger. Gustav line—a strongly fortified line running through Castel di Sanro, C., Castelforte, and Minturno—and bore down on C. There followed four house-to-house fighting in the tn., and by Feb. 11 part of it was in ruins. On Feb. 13 the Allies prised the Germans out of the fortified basements of C. prison and, two days later, Amer. forces held about one-third of the tn. Having ascertained, beyond all possible doubt, that the Germans were using Monte C. as a stronghold, the Allies prepared to bomb the monastery in the hope of removing the strongest enemy defence of the road to Rome and of C. itself; and on Feb. 15 the monastery was subjected to an aerial bombardment, accompanied by an artillery assault on the German positions in and around C. and

far back in the Liri valley S. of C. But no decision was reached for the possession of C. and the situation remained a stalemate, with only desultory artillery exchanges, until March 15. On that date C. was heavily bombed, the Allies dropping some 1400 tons of bombs on an area of less than one square mile—a unique concentration even for this war. This bombing attack was part of a general plan of attack, for, immediately the bombing ceased, Brit. and Amer. artillery shelled Ger. positions in and around C., and Infantry pressed forward

above the tn. the broken abbey stood like rough spikes of rock on a hill-top. On March 17 New Zealand forces led an assault on the tn., while Indian forces took some hill positions overlooking it. By now, however, remnants of buildings and masses of debris, much of it resistant to high explosive, had been improvised by the enemy as strong-points and snipers' nests. It now became obvious to the Allies, ironically enough, that an immense amount of rapid repair work was necessary to enable tanks and transport to advance at all through C. where there were craters



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THE MONASTERY OF CASSINO, MAY 18, 1948

in the C. area, while aircraft bombed enemy centres of communication. On March 16 allied tanks and infantry entered C. and penetrated enemy positions in the hills N.W. of the tn. But the Allies now found their advance held up by the terrible devastation wrought by the air assault. The Gers. took full advantage of the masses of rubble as sites for mortars against Brit. efforts to clear a path for tanks; and thereafter the battle for C. pursued a grim course among the ruins and rubble of the tn. Much of the tn. of C. had been built flush with the rock of the hillside up which wound the road to the monastery, and in its remnants of shattered walls C. now looked as if it were mainly a series of caves in the hillside. Castle Hill, a low spur rising sheer within the tn. on its N. side, stood like a steep crag, its pinnacle a jagged rock unrecognisable as buildings, while high

40 ft. deep and full of water. Some progress was made on March 19, the New Zealanders overcoming resistance except in two especially strong points—the rubble of the Hôtel Continental, which faced the Via Casilina as it turns S. in its course through C. and which provided a highly effective emplacement for two Ger. tanks which were built into the ruins; and near by, on the other side of the road, the remains of the Hôtel des Roses, which two centres of resistance commanded what was the main street of the tn. along most of its course. Other enemy strongholds were lodged in the old Rom. amphitheatre and in the ruins of the ducal palace, both W. of the railway station and commanding the approaches from it and the roads westward from C. But such progress as the Allies made was always delusive because the Gers. were still in possession of many heights overlooking C. On the same date

Castle Hill, which had been taken previously and lost, was retaken by Indian troops. Hand-to-hand fighting went on with undiminished fury. But by March 26, though continual and bitter fighting was still in progress, the battle for C. was now more or less a stalemate once again, and, for some time, the struggle died down to desultory artillery duels. Throughout the ensuing six weeks before the tn. fell in May, the allied positions and those of the enemy in the tn. were so close upon each other in a series of loosely formed lines—reminiscent of the opposed forces at Stalingrad—that the least observable momentary movement of head or limb generally meant death or wound from snipers. Meanwhile the Brit. command spent the interval in further preparations, regrouping their forces and secretly moving the Eighth Army to the W. side of the front. The Fifth and Eighth Armies resumed the offensive on the whole It. front on May 11 and the brunt of the most violent fighting fell on the C. sector after large forces had crossed the Rapido R. The Gers. again resisted stubbornly and, N. of C., five abortive counter-attacks were delivered by them on May 14. But Brit. troops were now advancing on C. up the Liri valley towards the Via Casilina, while N.W. of the tn. Polish forces had, at heavy cost, gained vital positions N.W. of C. and the abbey, while, as part of the general pattern of the offensive, Fr. colonial and Amer. forces were breaking through the Gustav line along the S.W. of the front. The Gers. defending C. now found themselves in danger of being outflanked by the Brit. and the Poles and so began to withdraw from the Gustav line between the coast and C. while still struggling to keep their hold on the Via Casilina. On May 18 C. fell, at last, to Brit. troops, and the abbey was captured by the Poles. The Via Casilina had been cut and a large proportion of the Ger. 1st Parachute Div. destroyed in its efforts to escape at the last moment. Thus ended what may be compendiously called the B. of C. A few prisoners were taken by the incoming Brit. troops, to whose eyes was presented a scene of pitiful desolation such as only this war could produce. The last Ger. stronghold, the Hôtel Continental, or its remains, was blown up by the Gers. as they left—their Parthian dart. A crypt below the chapel of a convent was found to have received over one hundred direct hits but was impenetrable by anything less than a 1000-lb. bomb, which is some measure of the protection which the Gers. enjoyed throughout after the bombing of C. the previous March. See also under ITALIAN FRONT in THE SECOND WORLD WAR; WORLD WAR, SECOND, *Allies' Invasion of Italy*.

Cassiodorus, Flavius Magnus Aurelius (c. 490–c. 585). Rom. historian, statesman, and man of letters, was b. at Scylaceum in Calabria of a distinguished family. He rose to positions of responsibility under Theodoric, being sole consul in 514. After the death of this prince in 526, he

was chief minister for some years, but about 540 he retired from public life, and it is possible that he then became a monk. He is our chief authority for the hist. of the Gothic kingdom of Rome. His most important work, *Variae*, contains the decrees of Theodoric and his successors, and his own edicts when chief minister, etc. His other chief works are *Institutiones divinarum et humanarum litterarum*, and *Historia Gothorum*, of which we possess only a later epitome.

Cassiopeia, constellation in the N. hemisphere, not far from the N. Pole and close to Cepheus. In Nov. 1572, according to the observations of Tycho Brahe, a new star of great brilliancy blazed out here for ten days. Its brilliancy then diminished, and at the end of sixteen months it disappeared. According to the Gk. fable, C. was the wife of Cepheus and mother of Andromeda, placed in the heavens with her head from the pole, so as to turn round apparently upside down because, according to Hyginus, she boasted of her own beauty as superior to that of the Nereids.

Cassiquiare (*Cassiquiare*), deep, rapid riv. of Venezuela, S. America, forming the Orinoco's S. bifurcation. Issuing from R. Orinoco it enters R. Guainia, a branch of Rio Negro, near San Carlos, widening from 300 to 600 yds. It establishes water communication between the Amazon and Orinoco Rs.

Cassiterides, group of is. first mentioned by Herodotus as the place where the Phœnicians exchanged their wares for tin. They were fixed to the W. of Spain, and have been identified with the Scilly Is. and Cornwall, or the Brit. Is. as a whole. Others have suggested various small is. off the Sp. coast.

Cassiterite, or **Tin-stone**, prin. ore of tin, and is the binoxide of that metal with sometimes a little peroxide of iron, manganese, and silica. Its common name is tin-stone. It is a black or brown crystalline substance, the crystal form being tetragonal prisms terminated by tetragonal pyramids. It has a brilliant adamantine lustre. To obtain the metal from the ore it is crushed and washed and then heated in a furnace with charcoal and lime to remove the oxygen. The metal so obtained is purified by first heating it upon the hearth of a reverberatory furnace until the more fusible tin melts and flows away from the alloys mixed with it as impurities. Afterwards it is stirred with green wood, when the other impurities are carried off with the scum so formed. These consist generally of copper and arsenic. The Malay States (Negri Sembilan, Pahang, Perak, and Selangor), the Dutch E. Indies, and Bolivia supply over three-fourths of the world's tin-ore. The rest is produced chiefly in Cornwall (where the matrix has to be crushed to concentrate the finely divided ore), Siam, China, S. Africa, and Australia.

Cassius, Avidius (d. A.D. 175). Rom. general under Marcus Aurelius. He distinguished himself greatly in the Parthian war, and was therefore made

military governor of Asia. In 175, Aurelius was ill, and C. proclaimed himself emperor on the strength of a rumour of his death. He was slain by his own soldiers before steps could be taken against him.

Cassius Longinus, Gaius: 1. Rom. general and conspirator. He was the motive force in the conspiracy which resulted in the death of Julius Caesar. In 53 B.C. he served as quaestor in the Parthian war under M. Licinius Crassus, and earned fame by his masterly bringing off of the remains of the Rom. Army, after the defeat at Carrhae. After the battle of Pharsalus, he became reconciled to Caesar, whereas before he had sided with Pompey. For some time things went smoothly, but then he was offended at the appointment of M. Junius Brutus, whose sister he had just married, as praetor urbanus. After the assassination of Caesar, he went to Syria and crushed Dolabella. When the triumvirate was formed, he was with Brutus at Philippi, and, his own wing being defeated, he ordered his freedman to kill him (42 B.C.). Brutus lamented him as 'the last of the Romans.' 2. Rom. jurist, governor of Syria, A.D. 50 in the reign of Claudius. He was banished by Nero in A.D. 66, because he had, among his ancestral images, a statue of C., the murderer of Caesar. Recalled by Vespasian. He wrote ten books on the *ius civile*, and some other works. 3. **Cassius, Lucius Longinus**, tribune 137 B.C., author of the celebrated legal maxim *Cui bono?*

Cassius Gaius, called **Parmensis** after Parma, where he was b. He assisted in the assassination of Caesar, and after the battle of Philippi joined Pompeius. He afterwards went over to Antony, and when they had been defeated at the battle of Actium, he was put to death by Augustus, 30 B.C. He was a poet, and his productions were prized by Horace.

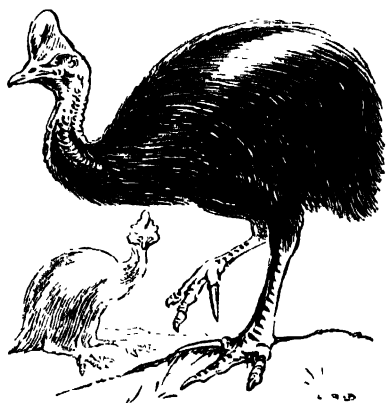
Cassius Viscellinus, Spurius, Rom. soldier and statesman, and founder of the first agrarian law. He was three times consul, in 502, 493, and 486 B.C. His agrarian law so offended the patricians and other wealthy citizens that he was put to death by them: some say the deed was committed by his own father. But according to Mommsen, the story is pure invention.

Cassivellaunus, Brit. chieftain who ruled the dist. N. of the Thames at the time of Caesar's second invasion (54 B.C.). After some Brit. successes, Caesar took the camp of C., and the chief was compelled to promise tribute and make submission.

Casook (Fr. *casaque*), military cloak. It was the name given in former times to the costume worn by soldiers, and it is not until a comparatively recent date that the word was used in an eccles. sense. The ant. style of Eng. C. was a double-breasted robe fastened at the shoulder, with sometimes the addition of a girdle at the waist. For all orders of the Eng. clergy black is the usual colour, though on some occasions purple is worn. In the Rom. Catholic Church it varies in colour according to the rank of the wearer.

Casson, Mrs. Lewis Thomas, see THORNDIKE, SYBIL.

Cassowary, or **Casuarium**, typical genus of the ratito family Casuariidae, which are found only in the Australian regions, and are closely related to the emeus. About ten species exist, which are generally divided into two groups, those with the helmet laterally compressed and those with a pyramidal helmet. The plumage of both sexes is a glossy black, the wings and tail are very small and the hen is larger than the cock. They are running birds with great powers of leaping, and when attacked they kick forward with their feet. They live in pairs in wooded



CASSOWARY

distts. and the cock usually incubates the eggs, about six in number, which the hen lays in a nest of leaves and grass. *G. benetti*, the mooruk, is the most common species.

Cast (moulding), see CASTING.

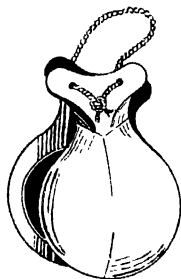
Castagno, Andrea del (1390-1457), It. painter, was b. at Castagna, in the dist. of Mugello. He was a member of the Florentine school, but may be called a draughtsman rather than a painter. His works are bold, but are often deficient in grace and delicacy. He d. of the plague at Florence.

Castaldi, Pamfilo (1398-1490), It. poet and humanist, b. at Feltré in Lombardy. He founded a school there, which earned great renown among foreign nations, and in which he became the teacher of the It. language and literature. Some It. writers, amongst them Bernardi, say that C. was the real inventor of printing with movable types, and that Johann Fust, who is supposed to have been one of C.'s pupils, and intimate friend, gave away the secret to Gutenberg. It is also alleged that in 1472 Galeazzo Sforza gave C. the authority to establish a printing press at Milan. See J. Bernardi, *P. Castaldi e l'Invenzione dei Caratteri Mobili per la Stampa*, 1865.

Castalia, fountain in Greece, now known as the Fountain of St. John, on Mt. Parnassus, sacred to Apollo and the Muses. It is named after C., daughter of Achelous, who threw herself into it to evade pursuit from Apollo.

Castalion, or **Chasteillon**, **Sebastiën** (1515-63), Swiss Protestant theologian and humanist, was b. near Bresse. In 1541 he visited Calvin at Strasburg, and in the same year the latter made him head of the college at Geneva. He was compelled to leave on account of small differences with Calvin, and lived in great poverty at Basle, till he was appointed prov. of Uk. in 1533. He pub. various works.

Castanea, small genus of Fagaceæ found in N. lands, the fruit of which is the chestnut. The horse-chestnut (*Aesculus Hippocastanum*) differs from this plant in order and everything but that is has a prickly fruit. In Spain, S. France, and Italy the fruit of the cultivated species is eaten raw, roasted, or ground into flour, and is extremely nutritious. The wood resists well the influence of water, and is well suited for mill-timber, water-works, and palings; the bark is used in tanning. *C. vulgaris* yields the edible sweet chestnut, which is developed from three female flowers, whose parts are enclosed in a prickly capsule.



CASTANETS

Castanets (Fr. *castagnettes*, Ger. *Kastagnellen*, Sp. *castañuelas*), musical instruments of percussion, introduced into Europe from the E. by the Moors, and are used in dancing. They are made of two hollow shells of hard wood, fastened together by a cord, which is passed over the thumb and first finger. They are used in pairs, one in each hand, and are struck against one another, which produces a series of clicks, thus marking the rhythm of the music. They were used by the Gks. and the Romans to accompany their Bacchanalian dances.

Castañes, **Don Francisco (Xaver) de**, Duke of Bailen (1756-1852), Sp. general, b. in Madrid. In early youth he entered the army, and went to Berlin in order to study military tactics under Frederick the Great. In 1808 he defeated 80,000 Fr. under Gen. Dupont de l'Étang at Bailen, but was himself beaten by Lannes at Tudela the same year.

Castanospermum australe, Australian chestnut, constitutes in itself a genus of the Leguminosæ. The plant is a tree 30 to 40 ft. high, its foliage affords an excellent shade, and the fruit when roasted resembles a chestnut in flavour.

Caste (from Portuguese *casta*, breed, Lat. *castus*, pure, chaste), term generally employed to denote the div. of Hindu society into various sections or Cæ. It has also been employed for any distinctions of class in any nations which have a similar exclusive effect. The system has prevailed in a greater or less degree among most peoples of the world. There are few traces of it amongst the Germanic races, and the idea derived from Herodotus that the Egyptians had a C. system was exploded by J. Ampère. However, it was found strongly marked in Peru, and anet. Persia had its threefold div. of the followers of Ahura Mazda into Atharvas (priests), Rathaevyas (warriors), and Vastryas (husbandmen), as the Zend Avesta tells us. The same distinctions are even now found in Africa and Polynesia, and the European social system is of a somewhat similar nature. However, it is in India that the C. distinction is found in its most fully developed form, and here it is most intimately connected with religion. According to a somewhat late hymn of the Rig-veda, possibly interpolated, the origin of the Cæ. is to be carried back to their birth from Brahma, when the Brahmans sprang from his head, the Kshatriyas from his arms, the Vaisyas from his thighs, and the Sudras from his feet.

The C. system of India is probably tribal in origin. The Aryans and their retainers by a process of natural selection, gradually resolved themselves into four classes—namely (1) Brahman or priestly C., composed of the *Kshis*, their descendants and disciples, to whom was entrusted the expounding of the Vedas and the conduct of religious ceremonies; (2) the Kshatriya, that is Rajput or governing and military C., composed of the maharajahs and their warrior kinsmen and companions, whose duty was to rule and fight, and administer justice and protect the community in general. This C. is represented in modern times by the Rajput and the Khatri. (3) The Vaisiya, a trading and agric. C. which, assisted by the conquered aborigines, tilled the land, raised cattle, and manufactured the arms and implements and household utensils required by the Aryan commonwealths. This C. is now represented by the Banya. (4) Besides the three Aryan Cæ., but immeasurably beneath them, there was the servile or Sudra C., composed of captured aborigines, whose lives had been spared, and of the progeny of marriages between Aryans of different Cæ., and of Aryans and the women of the country, all of which, by the rigid exclusiveness of the C. system, came to be regarded as degraded. Broadly speaking, the origin of the C. system was self-protection, and in India man withdrew himself into a C. as a refuge from oppression and, in time, came to pride himself on being, not a citizen, but an

outsider. Thus the Gonds from being a people sank into a C., and the largest of the Indian Cs. are, as indicated above, probably tribal in origin. The vast majority of Indian Cs., however, correspond to a difference of environment rather than of race, and, to-day, there are great numbers of Cs., throughout the country which represent the different callings in the various provs. Every vocation is occupied by its own C. or Cs., which may not marry nor even eat with other Cs. But no C. of occupation is general throughout the country, for each prov. has a separate gradation of its own. The one C. that pervades all India is the Brahmin, which is subdivided into innumerable sections, between whom there can be no alliance of bride and bridegroom. There are Hindu Cs., such as the Sikh, which have originated as the disciples of religious reformers, and, indeed, this kind of C., produced by local religious revivals, is in many cases of very recent origin. Certain Cs., too, claim to be hybrids, having originated from intermarriages between men of a higher and women of a lower C., thus, e.g. the Eurasians, a community of the larger cities, sprang in modern times from alliances between Europeans and Indians. Mixed alliances have not always been prohibited, and before the C. system became finally estab. the marriage of men with women of lower grades of society were common, until the occupants of those grades, resentful of the position, forbade their women to marry outside it.

It has been justly said that never has human society been more complicated or artificial than in the C. Members of a C. are isolated from all others by their marriage laws, social customs, religious practices, and precedence. Marriage outside the C. is an abomination, while within the C. it is limited by strict rule. Each C. contains groups, and bride and bridegroom should come from different groups. Even in matters of eating and drinking and social intercourse the C. has become an isolated unit, and eating and drinking are still ceremonial rites, tinged with symbolism. Totems and fetishes are a feature of the C., and representative implements of the C. are held in reverence, and once a year are formally worshipped. To touch the fetish of a C. is a sacrilege, and this or other minor breaches are visited with fines. It is generally accepted that the C. system in its present rigidity is a development of comparatively recent Hindu hist., and in the present day the process of C. subdivision still continues, old Cs. producing new as offshoots. The rise of some separate Cs. may correspond to a rise in social status, but in other cases the reverse holds good, as when, e.g., the Rajputs took to the cultivation of vegetables or the Brahmins used the plough. Amalgamation of different Cs. only arises from religious reform, and it is to such influence that the Sikhs owe their separate identity; and this, too, is the explanation of the development of the theistic community which in recent years grew up in Bengal under the name of the Brahma Samaj

(q.v.). But apart from these religious revivals, which have had no great effect as consolidating influences, the tendency is still towards the isolation of the C. unit. Whether, however, the present awakening of autonomous aspiration, coupled with the demand of educated Indian women for greater freedom of outlook and opportunity, will give an impetus to this idea and modify the rigidity of the C. system remains to be seen.

See report on 'Caste, Tribe, and Race,' in 1901 *Indian Census Report*; E. Thurston, *Castes and Tribes of Southern India*, 1908; B. Fuller, *Studies of Indian Life and Sentiment*, 1910, 1917; K. Mayo, *Mother India*, 1927, 1931; C. S. Ranga Iyer, *Father India: a Reply to 'Mother India'*, 1927; E. Senart, *Caste in India*, 1930; Report of the Simon Commission, 1930; S. S. Nehru, *Caste and Credit in the Rural Area*, 1932; Dr. G. Chand, *India's Teeming Millions*, 1939.

Castel, Castello (from It. *castello*, Sp. *castillo*, from Lat. *castellum*, dimin. of *castra*, camp), prefix added to names of various tns., etc., in Italy, France, and especially in Spain and Portugal.

Castelar, Emilio (1832-99), Sp. orator and statesman, b. at Cadiz. He became known for his eloquence in political matters, and in 1864 founded *La Democracia*, in which he wrote bitterly against the gov., and thereby lost his professorship. After an insurrection in 1866 he was condemned to death, but was able to escape to Paris, returning when the revolution of 1868 began. In 1873 he assisted in the downfall of King Amadeus, and the same year was made dictator by the Cortes, but when Alfonso XII. was proclaimed king of Spain, he retired into exile for fifteen months, and was then elected deputy for Barcelona. The remainder of his life he devoted to the study of hist. and philosophy.

Castelbuono, tn. of Sicily, 8 m. S.E. of Cefalù; it contains an old Benedictine monastery; also mineral springs. Pop. com. 11,000.

Castel di Sangro, city of Apulia, Italy. The lower part of this old tn. was almost entirely destroyed by Ger. demolitions in 1943, and the upper tn. suffered severely from ground fighting. The sacristy of the cathedral was fired by the Gers. The churches of San Giovanni and San Nicola were completely destroyed and the cathedral was the only undamaged church (apart from its sacristy). Pop. 10,000.

Castelfidardo, tn. and com. of Italy, situated in the prov. of Ancona, 10 m. S. of that place. A victory was won here by the Piedmontese over the papal troops in 1860. Pop. com. 7,000.

Castelfranco, tn. of Italy, in the prov. of Tuscany, situated on the R. Elsa, about 20 m. S.W. of Florence. The tn. suffered heavily in the Second World War, but its two outstanding monuments, San Francesco Church and the Chapel of the Visitation, were spared. Pop. com. 12,000.

Castelfranco; 1. Tn. and com. of Italy, in the prov. of Bologna, 16 m. N.W. by rail from the city of that name. The

manuf. of matches is carried on. The churches contain many valuable pictures of the Bolognese school. Pop. 17,000.

2. Also tn. in the prov. of Treviso, situated on the Musone. It is famous as the bp. of the painter Giorgione, and also for a victory gained by the Fr. in 1805 over the Austrians. There are manufs. of silk and woollen goods. Pop. 17,000.

Castel Gandolfo, tn. of Italy, in the prov. of Rome, and 14 m. S.E. of the city of that name. It is situated on a volcanic slope 400 ft. above Lake Albano. Here in the seventeenth century Pope Urban VIII. built a castle which was used as a summer residence by the popes until 1870. It reverted to the papacy under the Lateran Treaty of 1929. Pop. com. 3,000.

Castellammare: 1. Fortified and seaport tn. of S. Italy, 17½ m. S.E. of Naples. It lies on a sheltered portion of coast on the gulf of Naples, where it commands a magnificent view. In the fifteenth century it was pillaged by Pope Pius II., and again in 1654 by the duc de Guise. Its name is taken from the castello which was built there in the thirteenth century by Emperor Frederick II. The chief industries are the manuf. of cotton and macaroni. Pop. 30,000. 2. Tn. in Sicily 45 m. W.S.W. of Palermo. Trade in cotton, wine, corn, olive-oil, and anchovies. It stands at the head of a gulf of the same name. Pop. 18,000.

Castellamonte, nrkt. tn. of Italy, in the prov. of Piedmont, 10 m. S.W. of Ivrea, and 20 m. N. of Turin. It has an old castle, and a large market-place. The prin. industry is the manuf. of earthenware. Pop. com. 6000.

Castellan, keeper of a castle in medieval times. In different countries his rank and office varied. In Franco and Flanders the owners of certain domains held the title, which ranked next to that of bailiff.

Castellana, tn. of Italy, in the prov. of Bari, situated on the Adriatic coast. It is 26 m. S.E. of Bari and 8 m. S.W. of Monopoli. Pop. com. 12,000.

Castellaneta, tn. of Italy, 24 m. N.W. of Taranto. It possesses a cathedral, and is the see of a bishop. Pop. com. 11,000.

Castellazzo, tn. and com. of Italy, in the prov. of Piedmont, 5 m. S.W. of Alessandria. Pop. com. 6,000.

Castelleone, tn. of Italy, in the prov. of, and 16 m. N.W. from, the tn. of Cremona, also 12 m. S.E. of Lodi. Pop. com. 10,000.

Castellesi, Adriano (1460-1521), It. cardinal and writer. Came to England on a papal mission and was made bishop of Hereford and, later, of Bath and Wells. Recalled to Rome by Pope Alexander VI. and made a cardinal. Was a good Lat. scholar and wrote *De Vera philosophia ex quatuor doctoribus Ecclesiae* (1507); *De Venatore* (1512); *De Sermone latino et modo latine loquendo* (1513).

Castello, Sebastiano (1515-63), Fr. theologian, b. in Savoy, the original form of his name being Sébastien Châtillon. He studied at Lyons, and in 1540 became a teacher in a school at Geneva. His

religious views, however, did not coincide with those of Calvin, to whom he owed his position, so he was obliged to resign, and went to Basle, 1544. Here he was appointed prof. of Gk., 1553, and here he d.

Castello Branco, episcopal city of Portugal. It has an active trade in wine, olive oil, and cork, and possesses noted marble quarries. Many Rom. remains bear testimony to its great antiquity. Pop. 10,000.

Castello-Branco, Camillo, Visconde de Correia Botelho (1825-90), Portuguese author, b. at Lisbon. Studied in Oporto and Coimbra. Early an orphan bereft of both parents, he began his career of letters in order to gain a livelihood. Later on he went to the Episcopal Seminary in Oporto with the intention of entering the priesthood. He took orders, but his restlessness and want of stability forbade his keeping to one thing for any length of time, and in due course he resumed his former occupation. The best of his imaginative romances, written in the manner of Victor Hugo, are *O Romance de um Homem Rico*, *Retrato de Ruardina*, and *Os mysterios de Lisboa*. He was pioneer of novels of Portuguese social life and was excelled only by E. de Queiroz. Among his historical and biological books are *Noites de Lamego* and *Memorias d'a Bipo do Grão Para*. Created viscount, 1885, in recognition of his service to letters.

'Castello, De,' see VERGIL, POLYDORÉ. **Castello de Vide**, tn. of Portugal, in the prov. of Alentejo and the dist. of Portalegre, 40 m. S.E. of Abrantes. It has manufs. of cloth. Pop. 5000.

Castellon, or **Castellón de la Plana**: 1. Prov. of Spain in Valencia, bordering on the Mediterranean. There are silver and lead mines and factories of scarves, mantles, etc. Fishing is the chief industry. Pop. 308,000. 2. Cap. of the above prov. about 2½ m. from the Mediterranean. Field-gardens are cultivated, watered by the Nijares, whose waters are brought to the tn. by a magnificent aqueduct, Canal de Castellón. The tn. has manufs. of linen and woollen goods, earthenware, paper, and fire-arms, and is a centre of exports of fruit and wine. In the church of La Sangre are some fine works by the painter Francisco Ribalta. Pop. 36,600.

Castelnau, Noël Marie Joseph Fdoudard, Vicomte de Cuirières de (1851-1944), Fr. general, b. Dec. 24, at Saint-Affrique, Aveyron, where he attended the Jesuit school. After taking a science degree at Paris, he entered Saint-Cyr military school in 1869. He became general of div., 1910; assistant chief of staff, 1911. On outbreak of war, 1914, he commanded the Second Army in Lorraine. Afterwards employed between Somme and Oise, and in Champagne, and in Dec. made chief of staff. In Dec. 1915 he was sent on a mission to Salonika. When the Ger. attack was concentrated on Verdun (Feb. 1916), C., sent thither with overriding powers, safeguarded the r. b. of the Meuse. In Jan. 1917 he went on a mission to Russia. The great offensive planned

in 1918 was to have taken effect under his command in Nov., but Marshal Foch forestalled this plan and peace was declared. C. later entered the Chamber of Deputies as member for Aveyron (1919-24).

Castelnaudary (*Castrum Novum Arlanorum*, previously *Sostomagus*), tn. of S.W. France, dept. of Aude, near the canal du Midi. It is finely situated, and possesses various interesting buildings. There are flour mills, manufs. of earthenware and woollens, and foundries. Pop. 8000.

Castelnouvo, seaport and com. of Yugoslavia, situated near the entrance to the gulf of Cattaro. Brass is manufactured. Pop. 1500.

Castelnouvo Berardenga, tn. of Italy, in the prov. of Tuscany, about 10 m. E. of Siena. Pop. com. 11,000.

Castel San Giovanni, tn. and com. of Italy, in the prov. of Piacenza, and 15 m. W. of the city of that name. Pop. com. 11,000.

Castel San Pietro, tn. and com. of Italy, in the prov. of, and 12 m. S.E. from, the tn. of Bologna. The churches of Santa Maria Margiore (par. church), San Bartolommeo, and the oratory of the Crucifixion were slightly damaged in the fighting of 1944. Pop. com. 16,000.

Castelvetro, tn. of Sicily, in the prov. of Trapani, and 25 m. S.E. of that place. It is chiefly notable for the production of white wines, which are considered the best in the is. Coral and alabaster ornaments are made, and there are manufs. of silk, flax, and cotton. Pop. 25,000.

Casti, Giovanni Battista (1721-1803). It. poet, was b. at Prato in Tuscany, and early took orders. He taught for some time in the seminary of Montefiascone, but then gave up his hope of advancement in the Church and his canonry of the cathedral for the sake of travel. In the service of Joseph II. of Austria, he visited most of the European caps., and on his return that monarch gave him the position of *porta cesareo*, or poet laureate. In later life he resigned this position to avoid political strife, and settled in Paris as a private gentleman, to remain there till his death. His chief works are *Novelle galanti* (1793), a collection of tales in *ottava rima*, of which the plots are chiefly taken from La Fontaine and Boccaccio, and *Gli animali parlanti* (1802), an elaborate poetical allegory.

Castiglione, tn. and com. of Sicily, in the prov. of Catania, and 25 m. N.E. of the city of that name. It is noted for the quantities of filbert nuts grown there. Pop. com. 20,000.

Castiglione, Baldassare (1478-1529). It. statesman and man of letters, was b. at Casanatico, near Mantua, and received his education at Milan. About the year 1500 he entered the service of Guidobaldo da Montefeltro, duke of Urbino, whose court was one of the best in Italy. This prince sent him on an embassy to Henry VII. of England in 1506, and in 1524 he was charged by Pope Clement VII. with the difficult task of arranging a dispute between the sovereign pontiff and Charles V. This carried him to Spain, where he

was later naturalised and became bishop of Avila. He d. at Toledo, broken-hearted, it was said, at imputations of treachery which had been made against him. He was universally mourned, and Raphael's painting of him is well known. C.'s greatest claim to fame rests on his book, *Il Cortegiano*, written in 1514, which describes, in the form of dialogues, the composition of the ideal courtier. It is one of the noblest expressions of the Renaissance spirit, and has been trans. into most European languages.

Castiglione, Duke of, see AUGEREAU.

Castiglione Fiorentino, tn. and com. of Italy, 10 m. S.E. of Arezzo. There is a Plarist college and also a large orphanage. The tn. was terribly damaged in the Second World War, and the fine houses and the city gates were demolished; the church of San Francesco lost its roof as also did that of San Lazzo, but the church of the Gesu was unharmed. Pop. com. 15,000.

Castiglione, Giovanni Benedetto (1616-1670), It. painter of the Genoese school, known in Italy as Il Gretchetto (the Little Gk.), and in France as Le Bénédette, was b. in Genoa, and studied under Vandyck. He painted landscapes as well as historical pieces. His etchings are distinguished by light and shade effects. His best-known work is 'The Animals entering the Ark.'

Castiglione del Lago, tn. of Perugia, Italy. It was shelled in the stubborn fighting W. of Lake Trasimeno in 1944. The church of the Maddalena was much damaged, but an altar-piece, attributed to Raphael, had previously been removed to safety.

Castiglione delle Stiviere, city of Lombardy, N. Italy, in the prov. of Como, 22 m. N.W. of Mantua. It is defended by an old castle, and is noted in hist. for a victory gained by the Fr. over the Austrians in 1798. Pop. com. 8000.

Castile (Sp. *Castilla*, from *castillo*, a castle), former kingdom of Spain, occupying the central tableland of the peninsula. The highest mts. are the Sierra de Gredos (Plaza de Almangor, 8730 ft.) and the Sierra de Guadarama (Pico de Penalara, 8100 ft.). The average altitude of the N. plateau is 2500 ft. Old C. or Castilla la Vieja occupies the N. dist., and New C. or Castilla la Nueva the S. part of C. The N. region is watered by the Duero and its affluents, but in the summer is very dry and barren. In the S. flow the Jucar, Tagus, and Guadiana. The valleys are very fertile. The kingdom of C. was formed during the eleventh century, and was united to the kingdom of Leon in 1230. In 1085 the Moorish kingdom of Toledo was conquered and added to the Castilian realm. Toledo became the cap., but Valladolid was also used as the royal residence. By marriage of Ferdinand of Aragon and Isabelle of C. in 1469, the two kingdoms became united ten years later. In 1492, by the conquest of Granada, the whole of Moorish Spain came under Christian rule. The chief

industries of the inhab. of Old C. are cotton and linen weaving and stock-breeding. Olives, saffron, pulse, and grain are cultivated in New C. The inhab. engage in stock-breeding and the manuf. of coarse woollens.

Castilho, Antonio Feliciano, Visconde de (1800-75), Portuguese poet, b. in Lisbon. He was blind from the age of six. In 1821 he pub. *Cartas de Echo e Narciso*, which attracted much attention. *Amor e melancolia* (1828), *A Primavera* (1837), and *O Outono* (1863), are the poems on which his reputation stands. During the revolution of 1845 he was obliged to take refuge in the Azores, and did not return to his native land till 1863. His play *Camoens*, adapted from the Fr., was completed in 1849. C. won a high reputation for scholarship. He trans. the *Metamorphoses* of Ovid in 1841, and the *Georgics* of Virgil in 1865. *Consulte* the *Memorias* by his son, Julio de C., 1881.

Castilla la Nueva (New Castile), one of the historic divs. of the Iberian peninsula. It comprises the five provs. of Guadalajara, Ciudad Real, Madrid, Toledo, and Cuenca. It was in ant. times inhabited by the Celtiberian tribes. See CASTILE.

Castilla la Vieja (Old Castile), one of the historic divs. of the Iberian peninsula. It comprises the eight provs. of Palencia, Valladolid, Avila, Soria, Logroño, Segovia, Santander, and Burgos, and, in the form of an elevated plateau, extends as far as the bay of Biscay. See CASTILE.

Castillejo, Cristóbal de (c. 1494-1556), Sp. poet, b. at Ciudad Rodrigo, Salamanca. He was attached to the Emperor Ferdinand I., brother of Charles V., first as a page and later as secretary, and spent many years in Germany. His poems were first ed. in 1573, and later in 1598 and 1600. He strongly opposed the poetical innovations of the school of Boscan, which sought to introduce lt. metres, such as the sonnet and the *terza rima*, into Sp. literature. His poems are written in a gay or satirical vein, and have plenty of verve. A complete ed. of his works was pub. in Madrid in 1792.

Castillo de Locubín, tn. of Spain, in the prov. of Jaén, and 18 m. S.W. of the tn. of that name. Pop. 8000.

Castillo Solórzano, Don Alonso del (c. 1580-1643), Sp. writer. Remembered chiefly for picturesque stories which have formed the foundation of stories by far better known authors like Le Sage and Scarron. Le Sage's *Gil Blas* is much indebted to C.'s *Adventures of Trapazán*; Scarron's *Don Japhet d'Arménie* is based on C.'s *Marqués del Cigarral*; while Thomas Corneille's *Bertrud de Cigarral* is only an imitation of C.'s story. Other works include a Seville romance, pub. 1634 and trans. into Fr. 1661 as *Fouine de Séville* or *Hameçon des Courses*; *Tardes entretenidas* (1625); *Jornadas alegres* (1626); and *Teresa de Manzanaro* (1634) (novels); *Las Harpías en Madrid* and *Piñetas del Jardín* (plays).

Castillon, tn. in the dept. of Gironde, France, on the R. Dordogne, 33 m. E. of Bordeaux. Here in 1453 the Eng. were defeated (see Shakespeare, *1 Henry VI.*,

Act iv.), and in the neighbourhood is the château where Montaigne passed the later years of his life. Pop. 3000.

Casting, name given to the process of manufacturing articles of given shape by pouring a molten substance into moulds and allowing it to solidify and take up the shape of the moulds. The art finds its application in the manuf. of iron Cs. (founding) of every description, of statues (in which case bronze is the metal usually employed), of type for printing purposes, of plaster casts, and in a somewhat different manner in the manuf. of china-ware and pottery. The C. of bronze vessels and images is a metallurgical process of great antiquity. It was a well-known art in ant. Egypt, many bronze statues belonging to this period having been discovered. From many passages in the O.T. it is evident that the Israelites were familiar with the arts of metallurgy, vessels and ornaments being cast in bronze for the furnishing of the Temple. Little is known, however, of the methods employed by the antcs. in the C. of metal articles, and it is probable that the treatment of metal by smiths' work was more common. The manuf. of cast iron is of comparatively recent date, one of the most important uses to which the latter was first put being the manuf. of cannon. In the reign of Queen Elizabeth sev. large foundries existed, wood furnaces being exclusively used. Owing to the use of wood as fuel the first foundries were always built near forests, and it is on this account that Sussex became the seat of the iron-smelting industry. Although this industry has long been extinct, many relics of it occur in Sussex cottages and farmhouses in the form of old-fashioned fire-grates, originally cast in the locality. Wood furnaces are particularly well adapted for smelting purposes, as wood does not contain the chemical constituents which cause coal to react in a harmful way with the molten metal, and the superiority at the present day of iron smelted in Sweden is due to the fact that wood is used as furnace fuel in that country.

The increasing demand for cast-iron articles and the limitations of the timber supply, however, resulted in the introduction in the beginning of the seventeenth century of the use of coal for smelting purposes. The iron being reduced from its ores and procured in a molten condition, the process of C. is in brief as follows: The foundry floor is covered sev. feet deep in sand, and pits of sand are arranged where the moulds are to be placed. To construct a mould it is first necessary to obtain a pattern of the article to be cast, and pattern-making forms of itself an important craft. An exact model of the article to be cast having been made, this is pressed down into the sand and the sand rammed tightly around it so that on withdrawing the pattern a cavity the exact shape of the article required remains. Precautions are made to ensure the mould's retaining its shape, special qualities of sand or loam being employed, and in the

case of large *Cs.* the mould is built up with metal bars. The pattern being taken out, the mould is then thoroughly freed from moisture, this precaution being necessary to avoid explosions caused by the instantaneous generation of steam at the high temp. caused by the introduction of the molten metal. Neglect of this precaution has resulted in the wrecking of a whole foundry. The mould is provided with flues to admit the molten metal and also to allow for the escape of the air displaced by it, and it is placed near the furnace in such a position that the molten iron may flow direct into it by means of channels made in the sand. The metal is allowed to run in until it overflows the channels, the sand being meanwhile rammed down around the mould in order to keep it firm. The work is covered with a layer of sand and left to cool and solidify. The mould is then scraped off, and the cast is chased and worked up for the purpose for which it was designed. The prin. defects likely to be found in *Cs.* are blowholes, shrinkage cavities, porous places and cracking resulting from the trapping of gas in the metal, the use of feeding heads which are too narrow, or excessive ramming which prevents natural contraction.

The making of patterns is one of the most important crafts connected with the *C.* industry. The object to be aimed at is the making of a pattern which can be easily taken out from the mould without damaging it. It is evident that in many cases the shape of the pattern would render this impossible were it made in one whole piece. The pattern is therefore carefully constructed in sections, with joints so situated that the parts can be extracted from the mould without fracturing the latter. In many cases a core is used by means of which the thickness of the cast may be regulated. The mould being made as before, a substance, usually clay, is pressed into it, so as to form a layer inside the mould of the thickness which it is required that the metal *C.* shall be. The remainder of the mould is then filled up by means of plaster of Paris, and this on setting constitutes the core. When the whole is set and dry the mould is taken to pieces, and the clay or other material used as an intermediate layer is removed. The mould is then put together again and the core fixed in position. On allowing the molten metal to enter, it fills up the space between core and mould and a cast of the required thickness results. The introduction of *machine moulding*, in which the mould and pattern are manipulated by machinery, has resulted in the attainment of a higher degree of accuracy in the manuf. of *Cs.* than was formerly the case. For *cast-iron* see under IRON AND STEEL. See also POTTERY; TYPE AND TYPEFOUNDING. See J. S. Gardner, *Ironwork*, 1927-30; H. L. Campbell, *Metal Castings*, 1936.

Casting Vote, vote given by the chairman of any assembly when the votes for and against any proposition and resolution happen to be equal, and therefore the deciding vote. Where the chairman

has already voted he may yet be entitled to a second or *C. V.* The privilege is given to the chairman of a bor. council, an urb. or a rural dist. council, and a vestry meeting; and to a person actually occupying the chair at a meeting, whether he be the chairman or not, in the case of a par. council or par. meeting under the Local Government Acts. The chairman of an incorporated joint stock company is usually entitled to a vote not only as a principal and proxy, but also to a *C. V.* on an equality of votes at any general meeting of the shareholders. In the House of Commons, if the members in a div. are equal, the Speaker must give the *C. V.*, otherwise he never votes. Since 1848 the chairman of any standing committee of the House has been entitled to a *C. V.* To prevent any imputation of partiality, both the Speaker and any chairman of a committee in the House take care, where possible, to vote in such a way as to leave room for a further discussion by the House. According to the estab. rules of Parliament the chairman of a select committee has a *C. V.*, but no other vote. In regard to all questions before private Bill committees the chairman has a second or *C. V.* In the House of Lords the rule in regard to the vote of the chairman of committees is different; although he may record a vote like any ordinary member, he has no *C. V.*, the result being that the question is decided in the negative.

Cast Iron, see under IRON AND STEEL.
Castle (Lat. *castellum*, dimin. of *castrum*, a fort; Fr. *castel*; It. *castello*; Sp. *castillo*; Dan. *kastel*), fortified building, a fortress. Before the Norman Conquest *Cs.* were almost unknown in England. The earliest pre-Norman fortresses consisted of earthen ramparts or rows of palisades erected on a naturally strong and commanding eminence. The site was defended either by difficulty of access, such as that presented by an escarpment, or by water, generally a riv. or a lake. These natural defences were supplemented by artificial ones, such as a mound dug out of the ground surrounding the spot; this device provided also, at one and the same time, a ditch. Sometimes primitive edifices were constructed upon piles. The lake dwellings and hill forts of Scotland are examples belonging to this period. The Barmukin of Kent in Aberdeenshire is a type. In England there are the forts of the Herefordshire Beacon in the Malvern Hills. In these spots traces are to be seen of circular stone walls surrounded by ditches. The oldest *Cs.* of which remains of any importance still exist are of Rom. origin. Richborough *C.* in Kent is the best example. Conisburgh *C.* in Yorkshire, which is nearly contemporaneous with this, may be Brit.; it is probable that the inner keep is of Saxon origin, and that the outer walls were built by the Normans. Later come Saxon *Cs.*, like that of Castleton in Derbyshire. When William the Conqueror returned to Normandy in 1067 he left England in the hands of Odo of Bayeux and Fitz-Osborn, with orders to build *Cs.* at all important

points. Wherever a portion of the country was conquered there a C. was built to secure the conquest. These fortresses were like those of France, of the same period—Chauvigny, Beaugency, Loches, Falaise, Domfront, Chambois, and Nogent-le-Rotrou, for example. By the end of the reign of Stephen 1115 of these Cs. had been built. Each C. was the impregnable stronghold of a Norman baron, who used his power and position, not only to protect himself against the attacks of those Eng. who had been despoiled of their lands to provide a reward for him, but to oppress in every way the

or through a tower or fore-work in which was a stone staircase. This first floor was lighted by loop-holes in the walls, and here were the soldiers' apartments, the guard-room, etc. On the second floor was the baronial hall, where the governor and his retainers took their meals. Above this were the rooms used by the governor and his family; this floor was lighted by small round-headed Norman windows. The top was crowned with battlements. Outside the keep and surrounding it was a courtyard, called the inner bailey; this was divided by a wall from a second courtyard,



RHUDDLAN CASTLE, FLINTSHIRE, NORTH WALES
An English (or Edwardian) castle built by Edward I. in 1277

John H. Stone

conquered people. Wm. of Newbury says: 'There were in England as many kings, or rather tyrants, as lords of Cs.' Indeed, so great was the abuse that a treaty was made between Stephen and the duke of Normandy (afterwards Henry II.) that a certain number of the Cs. should be demolished within a stated time. This was done, but not to the extent stipulated. The Norman C. was built generally on an eminence, and on a bank of a riv. Its most characteristic feature was its innermost and strongest part—the keep. This was a square or an oblong tower, the walls of which, built of stone and mortar, were very thick; indeed, these solid walls were its chief defence. The basement was vaulted, no provision was made for the entrance of light, and air was admitted only by very narrow openings in the walls. Here were the store-rooms and the dungeons for prisoners. The entrance to the keep was usually on the first floor, admittance being gained either by a ladder

called the outer bailey. Round the inside of the inner wall were offices for retainers and soldiers, granaries, store-houses, etc. The wall of the outer bailey was from 8 to 10 ft. thick, 20 to 30 ft. high, and was surmounted by a parapet at least a foot in thickness. This parapet, with its crenellated embattlements, protected the defenders of the C., who discharged arrows, darts, and stones through the crenelles. At the angles of this fortification were the square or round towers called bastions; in or near one of these was the postern gate for the egress of messengers during a siege. The main gate was of enormous strength, flanked by towers and closed by a portcullis. Surrounding the whole fortress was a deep ditch or fosse, crossed by a drawbridge. Between the ditch and the prin. entrance there was often a high battlemented wall called a barbican, to defend the gate and the drawbridge, which could be pulled up against it, thus

cutting off communication. Later castles departed in architectural style and conception considerably from the Norman, assuming in the reign of Edward I. a more utilitarian plan, less in the nature of private dwellings, and more in that of barracks. Rhuddlan and Flint Cs. in Wales are examples of this Edwardian development. Numerous ruins remain. Some like Arundel and Alnwick have been rebuilt on the old plan. Others, notably Bodiam in Sussex and Tattershall in Lincolnshire, have been restored. A good impression of the appearance of a typical medieval C. may be derived from the extant ruins of Rochester, Durham, and Berkeley Cs. See F. M. Stenton, *The Development of Castles in England and Wales*, 1910; Sir C. Oman, *Castles*, 1926; N. G. Tranter, *Fortalices and Early Mansions of Southern Scotland*, 1935; H. Braun, *The English Castle*, 1936.

Castle, Egerton (1858-1920). Eng. author, educated at the univs. of Paris, Glasgow, Cambridge, and at the Royal Military College, Sandhurst. His novels include *Consequences* (1891); *The Light of Scarthay* (1895); *Young April* (1899); *The Secret Orchard* (dramatised for the Kendals) (1901); and in collaboration with his wife, Agnes, *The Pride of Jennico* (1898); *The Bath Comedy* (1899); *Incomparable Brillaire* (1904); *If Youth but Knew* (1905); *The Lost Iphigenia* (1911); *The Grip of Life* (1912); *The Ways of Miss Barbara* (1914). He wrote *Saviolo* for Sir Henry Irving (1893) (with Pollock), and *Desperate Remedies* for Mansfield. An authority on swordsmanship; captain of the Brit. épée and sabre teams at the Olympic games, 1908.

Castlebar, co. tn. of co. Mayo, Eire. It is an important mkt. tn. for agric. produce, and there are also breweries and some trade in linen. Here in 1641 the Irish massacred the Eng. garrison, and in 1798 the Fr. Gen. Humbert defeated the Eng. in a battle facetiously called the 'C. Races.' Pop. 4300.

Castleblayney, mkt. tn., co. Monaghan, Eire. Pop. 1600.

Castlecary: 1. Mkt. tn. of Somersetshire, England, 12 m. N.E. of Yeovil. There are manufs. of twine, horse-hair seating, etc., also brickworks. Pop. 1600. 2. Par. of Strirlingshire, Scotland, 6 m. S.W. of Falkirk. It is the site of a fort which defended the wall of Antoninus.

Castlecormer, tn. of Eire, in the co. of Kilkenny, and 10 m. from the tn. of that name. It is situated on the R. Dinin. Pop. 900.

Castleconnell, vil. on the Shannon in Limerick, Eire. Here are the ruins of Connell Castle. There is good salmon fishing.

Castle Donington, mkt. tn. of England, in the co. of Leicestershire, overlooking the Soar and Trent valleys. It is 2½ m. W. of Kegworth by rail. There are manufs. of hosiery, silk, and baskets. Pop. 3000.

Castle Douglas, mkt. tn. and bor. of Scotland, situated in Kirkcudbrightshire, on Carlingwark Loch. The sheep and cattle sales held here are noted. Pop. 3000.

Castleford, tn. in the W. Riding of Yorkshire, England, situated on the R. Aire, 10 m. S.E. of Leeds. It is a colliery dist., and there are chemical and glass works, also potteries. Rom. relics have been discovered in places near by, and the Rom. road, Watling Street, passed through the dist. Pop. 22,000.

Castle Garden, circular fort in Battery Park, New York City. It was built in 1807, and was originally called Fort Clinton, and was used for public functions. It was the headquarters for immigrants from 1855 till 1890, when it was equipped as an aquarium.

Castleisland, par. and tn., co. Kerry, Eire. Pop. of par. 5000, of tn. 1300.

Castleknock, vil. on the Liffey, co. Dublin, Eire, 5 m. from Dublin. Pop. 200.

Castlemaine, tn. of Talbot co., in the state of Victoria, Australia, on Forest Creek, and on the railroad from Melbourne to Echuca. The gold-mines near were among the first to be opened in the colony. Pop. 6000.

Castlereagh, mkt. tn., co. Roscommon, Eire. Pop. 1200.

Castlereagh, Robert Stewart, Viscount, second Marquess of Londonderry (1769-1822), eminent Eng. statesman. He was the second son of Robert, first marquess of Londonderry, and was educated at St. John's College, Cambridge. He sat in the Irish Parliament in 1790, and was appointed keeper of the privy seal in 1797, and chief secretary for Ireland in 1798. C. actively supported Pitt in bringing about the union between England and Ireland, and on entering the Imperial Parliament, he became secretary of state for war (1805-6). On the death of Pitt, he resumed office under Portland. The failure of the Walcheren expedition (1809) brought about a quarrel between C. and Canning, the foreign secretary, which resulted in their retirement from office, and in the duel which took place the latter was wounded. In 1812 C. became foreign secretary under Lord Liverpool; it was during his period of office that Wellington won his brilliant victories, the success of the campaign of 1812-14 being largely due to C.'s steadfast and energetic policy. He represented England at the congress of Vienna (1814-15), the treaty of Paris (1815), and the treaty of Aix-la-Chapelle (1818). The despotic measures resulting from his domestic policy were extremely unpopular. He was regarded as being responsible for the 'Peterloo massacre,' and the 'Six Acts' (1819), and few statesmen have been so hated by the general public. Harassed by affairs, in a fit of insanity, he committed suicide with a penknife at his Kentish seat, Fonthill. As his coffin was being carried to Westminster Abbey, a shout of joy came from the crowd in the streets. C. was undoubtedly a harsh ruler, but the years of peace that followed Napoleon's fall were largely due to his wise diplomacy. See C.'s *Correspondence and Dispatches*, ed. Vane, 1847-53; the lives by Sir A. Alison, 1861; the Marchioness of Londonderry,

1904; J. A. R. Marriott, 1936; and Lord Salisbury's *Essays* (republished 1905).

Castle Rising, vil. near King's Lynn, Norfolk, England, and formerly an important tn. and seaport. It is notable for the ruins of a fine Norman castle, for a beautiful twelfth-century church, and for Bede House, founded in 1614 for a few poor women, whose successors even to-day wear the original Jacobean dress. Pop. 200.

Castleton, vil. in Derbyshire, England, 13 m. W. of Sheffield. It is situated at the foot of a hill, on the summit of which stands Peak Castle, erected by Wm. Peveril, the natural son of William the Conqueror. In the neighbourhood are Peak and Spedwell Caverns and the Blue John Mine. Notable also for its fluorspar. Pop. 700.

Castletown, formerly the cap. of the Isle of Man; in the extreme S. of the is., on the W. coast of C. Bay, 9 m. S.W. of Douglas. From a rock in the centre of the tn. rises Castle Rushen, said to have been erected in 960 by Guthred II. of the Orrys kings of Man. It was once the residence of kings, and was besieged for six months by Robert Bruce in 1313. The castle has now been converted into a prison and barracks. King William's College, in the vicinity, is a noted school for boys. C. is a popular resort for tourists. Pop. 2000.

Castor, abbreviation for *Castoreum* (Gk. *καστιωρ*, beaver), reddish-brown substance obtained from the beaver, being contained in two pear-shaped pouches near the organs of reproduction. It contains a crystalline substance castorin, salicin, benzoic acid, and other substances, has a bitter taste and a strong, penetrating, and enduring odour. Formerly it was much esteemed as a medicine, being used in the form of a liniment as a stimulant and antispasmodic, but it is now used only in perfumery.

Castor (*Alpha Geminorum*), one of the two bright stars in the head of the 'twins' which form the constellation Gemini. It is a double star, that is to say, it consists of two stars so close together as apparently, to the naked eye, to form one star. The two component stars are nearly equal in size, and together form the appearance of a third magnitude.

Castor and Pollux (Gk. *Πολυδευκες*), twin gods of Greece and Rome, known as the Dioscuri. According to Homer they were the sons of Leda and Tyndareus, king of Lacedæmon, and brothers of Helen and Clytemnestra. According to another version, Zeus appeared to Leda in the form of a swan, and she bore two eggs, from one of which came P. and Helen, children of Zeus, and from the other C. and Clytemnestra, children of Tyndareus. Thus P. was immortal, while C. was subject to old age, sickness, and death. They both took part in the expedition of the Argonauts, during which P. slew Amycus, and in consequence became famous as a boxer and wrestler. C. was renowned for his horsemanship. They made war upon the Athenians to recover their sister Helen, who had been carried away by Theseus.

C. and P. seized the intended brides of Lynceus and Idas, sons of Aphareus, and in the battle that ensued C. was slain by Idas. P. avenged his brother by killing both the Apharidae, and then besought Zeus to grant immortality to his brother. Zeus allowed them to share immortality, so that each dwelt in the abode of gods on alternate days. It is also said that Zeus placed them among the stars as Gemini. The Dioscuri were worshipped as protectors of sailors. The Romans believed that they owed to them the victory at Regillus, and erected to their worship a temple opposite that of Vesta. They were always represented as riding white steeds, with a star shining on their helmets.

Castoreum, see **CASTOR**.

Castoridae, name of the third family of the sub-order *Simplicidentata* of the rodents. It contains a single living genus, *Castor*, the beaver, one species of which is European, the other N. Amer. Many extinct forms of this family are found as fossils.

Castor Oil, heavy viscid natural oil obtained by crushing the seeds of the C. O. plant, *Castor communis*. These are first rolled, and then placed in hempen bags and subjected to high pressure by which the oil is squeezed out. The plant is grown chiefly in India, the greater part coming through Calcutta, but it is also grown in the U.S.A., France, and Italy. Chemically it is the glyceride of ricinoleic acid, and is soluble in alcohol, the sp. gr. varies from 0.960 to 0.968, and the freezing point from 10° to 18° C. The best is 'cold-drawn C. O.', which is extracted without heat and is pale yellow or nearly colourless and almost tasteless. It is used in medicine as a safe non-irritating purgative, the most suitable for young children. It causes only evacuation of the bowels, and is very useful for cases of gastritis, enteritis, and dysentery. The dose varies from a teaspoonful to two tablespoons, and as the cheaper varieties have a disagreeable taste, it is generally advisable to mix it with something more palatable, such as milk or lemon juice. The raw oil is used as a lubricant, as a mordant in dyeing, and in India as an illuminant.

Castration, operation of removing the testicles or reproductive organs of the male for various purposes. In human beings it is generally performed when these organs are injured or diseased, while in the E. it is a precautionary measure practised on slaves destined to become eunuchs or guardians of the harem or seraglio. The operation is also performed on horses, pigs, sheep, and cattle. The effect is much the same in all male animals treated in this manner. If it is done before puberty the masculine qualities are not developed. In human males the voice does not break nor the hair grow upon the face; in sheep and cattle the horns are either not formed or they take a shape similar to those possessed by females. A castrated cock does not crow, and its feathers are changed in character. Reproduction is quite impossible. If the operation is performed after puberty,

it is often dangerous in its effects, the change is slow in the masculine qualities, and procreative power is not immediately lost. It was in the seventeenth century that the Sistine Chapel in Rome substituted *castrati* for the imported adult male sopranos or 'falsettists' of Spain, whose effects were obtained by some process which is now unknown. The artificial male soprano or contralto was obtained by an operation in boyhood on the sexual organs which hindered the development of some of the characteristics of manhood and thereby perpetuated the boy's type of voice. Perhaps the most celebrated castrato singer of all time was Farinelli (q.v.).

Castren, Mathias Alexander (1813-52), Finnish philologist, b. at Tervola, in N. Finland. He studied in Tornea and also in Helsingfors. His intense interest in Lönnrot's publication of *Kalevala* seems to have impelled him to the study of the language and literature of his country. For this purpose he journeyed on foot through Finnish Lapland in 1838 and through Karelia in 1839, collecting ballads and songs of Finnish mythology. As a result of these excursions he pub. *De Affinitate Declinationum in Lingua Fennica* (1839), and a Swedish translation of the epic *Kalevala* (1841). With Lönnrot, he continued his literary researches in Finland, Norway, and Russia (1841-45), and worked at the St. Petersburg Academy (1845-49). In 1851 he was appointed prof. of the Finnish language and literature at the univ. of Helsingfors. He is considered the founder of Ural-Altaian philology. See life by J. W. Snellman in *Samlade Arbeten*, 1892-1901.

Castrense Peculium (Lat. *peculium*) literally denoted property in cattle (from *pecus*, cattle), but came to be used of the private property of a wife, or that which is given by a father or master to his child or slave. According to Rom. law a man had no property independently of his father, but C. P. that is money acquired by military service (Lat. *castra*, a camp), was regarded as the private property of a son. Later a man was allowed to be sole possessor of any professional earnings, and of property inherited through his mother, in which cases it was known as quasi-C. P.

Castres, tn. of France, in the dept. of Tarn, 46 m. E. of Toulouse. It is situated on both sides of the R. Agout, which is spanned by stone bridges. It is thought that the tn. is on the site of an old Rom. camp, hence its name; but its hist. goes back to the foundation there of a Benedictine abbey in 647. In the sixteenth century it was a Huguenot stronghold. The tn. is beautifully kept, and has an important trade in manufactured goods, leather, paper, dyeing, machinery, parchment, etc. Pop. 30,700.

Castries, or Port Castres, cap. of the is. of St. Lucia, W. Indies. It is situated in Carenage Bay and makes an excellent port and harbour. The port of C. is one of the best harbours in the W. Indies. It is land-locked and provides facilities for coaling and watering ships and for loading

and discharging cargo which are unequalled in these is. C. has a large trade in sugar and cacao. C. was largely destroyed by fire on the night of June 19, 1848. Buildings destroyed included gov. offices and the chief business houses. There was no loss of life, but some 20,000 of the pop. were made homeless. The fire started in a tailor's premises, and the police—the town's only fire-fighting force—had little hope of controlling the flames owing to the low pressure of the water supply, depleted by a long drought. The estimated pop. of C. and dist. is 20,800.

Castro, modern name given to the chief tns. of certain is. in the Gk. Archipelago, viz., Chios, Limno (Lemnos), and Mtiline (Mytilene), which are otherwise known by the names of the is.

Castro, Alfonso (c. 1495-1558), Sp. theologian, b. at Zamora. He entered the Franciscan order, and became private chaplain to Philip II., whom he accompanied to England in 1554 for the purpose of negotiating a marriage between that monarch and Queen Mary. He wrote a Lat. work on heresy, entitled *Adversus omnes hæreses libri xiv.* (1534). He was sent with Philip of Spain to England as his adviser, 1554, and criticized the burnings of Eng. heretics. His pub. sermons on heretics include *De justa hæreticorum punitione* (1547), and *De potestate legis penalis* (1550). Became archbishop of Compostella, 1557.

Castro, Cipriano or Cypriano (c. 1858-1921), Venezuelan military leader and president, b. in the Andean prov. of Tachira. His parents were Sp. mestizos of the peasant class. He early took an active part in local politics in Capacho, as a Liberal, forming a party called 'Castriastas.' In 1866 G. was successful in the 'battle of Capacho' against Morales, who was local representative of the López gov. In 1899 C. headed a rebellion against President Andrade. After engagements in Las Pillas, at Zumbador, and San Cristóbal, he pushed his way on to the cap., Caracas. Andrade fled to Curaçao, and C. declared himself *jefe supremo* (supreme military leader). He was made provisional president of Venezuela by the constituent assembly (1901), and in 1902 was formally elected president for six years. His administration was marked by numerous uprisings, first that of Hernández, then that of Poraza, and finally that headed by Matos (1902-3), who tried to win the support of foreign govts. C. went to Europe in Dec. 1908, leaving his powers in the hands of the vice-president Gómez, who seized the presidency in 1909, and was popularly confirmed. In 1913 C. unsuccessfully tried to regain power. He remained a wanderer, chiefly in Germany. He d. at San Juan (Puerto Rico), Dec. 5, 1924.

Castro, Inez de (d. 1355), Sp. noblewoman, whose ad story has been used by poets and dramatists. In 1340 she lived with her cousin, Costanza de Paza, the betrothed wife of Dom Pedro, the son of Alfonso IV. of Portugal. On the death of her cousin in 1345, she secretly married

Dom Pedro. Alfonso, fearing that this union would be injurious to Ferdinand, the young son of Costanza, ordered her to be put to death. When Dom Pedro ascended the throne in 1357 he avenged her death and, according to one tradition, ordered his nobles to pay homage to her exhumed body. See Camoens, *Lusiadas*.

Castro, João (Juan) de (1500-48), Portuguese admiral, b. at Lisbon, the son of Alvaro de C., governor of Lisbon. He had the same tutor as Emanuel I.'s son, the Infant Dom Luis, who had a lifelong attachment for his young playmate. They were both present at the siege of Tunis in 1535. Upon his return to Lisbon C. received from the king a commission for the command of San Pablo de Salvaterra in 1538. C. was a man always contented with small means, but thirsted to do deeds of bravery. He married a noble Portuguese lady who was equally indifferent to wealth. Sailed to the Indies and joined the *aventureiros* for the relief of Diu. In 1543 C. undertook the task of clearing the sea of pirates, and later on again he was sent out to the Indies, where he ultimately received the appointment of viceroy, but d. soon afterwards.

Castro del Rio, tn. in the prov. of Cordova, Andalusia, Spain, on the r. b. of the Guadajoz. Part of the old walls and a Moorish castle remain. There are manufs. of woollen goods and earthenware. Pop. 12,000.

Castrogiovanni, city of Sicily, 13 m. N.E. of Caltanissetta. It is built on a mt. at an altitude of 3000 ft. and occupies the site of the anc. Enna. In the neighbourhood is Lake Pergusa, which is associated with the Proserpina myth. There is a fine cathedral (founded in 1307), an anc. citadel, La Rocca, and a castle built by Frederick II. of Aragon. The chief trade is in rock-salt and sulphur. Pop. 32,500.

Castroreale, tn. of Sicily, on the Castro, 12 m. S.W. of Milazzo. It has hot sulphur springs. Pop. 11,000.

Castro-Urdiales, tn. in the prov. of Santander, Spain, on the bay of Biscay. The chief industry is fishing, and fish and timber are exported. To the Romans, under Vespasian it was known as Flavobriga. The tn. was sacked by the Fr. army in 1813. Pop. 10,000.

Castrovillari, tn. of Italy in the prov. of Cosenza, Calabria, situated in a fertile valley. Olive oil is the chief production, and the manuf. of casks is carried on. Pop. 10,000.

Castro y Bellvis, Guillen de (1569-1631), Sp. dramatist, chiefly famous for his *Las Mocedades del Cid*, from which Corneille borrowed his materials for his tragedy *Le Cid*. C. was a Valencian by birth, and soon came into prominence as a

man of letters. He lived at Madrid, and was very friendly with the famous Sp. dramatist Lope de Vega, to whom he was greatly indebted for his style. He wrote some forty plays, chief among which may be reckoned his *Payar en propria Moneda* and *La Justitia en la Piedra*. C. has the characteristics of the Sp. writers of romance. His style is vigorous and passionate, and there is the romantic atmosphere so peculiar to the old Sp. romancers. He d. in great poverty.

Castruccio Castracani (1281-1328), It. general and soldier of fortune, b. of noble family in Lucca. In the early years of his career he served successively in France, England, and Lombardy. He was a staunch Ghibelline, and the people of Lucca made him the chief of their republic. In return for his services as adviser in his campaign against the Guelphs, the Emperor Louis of Bavaria made him duke of Lucca, Pistoja, Volterra, and Lunigiana, as well as count palatine. At the head of the Ghibelline party he carried on a war against the Florentines for fifteen years, at the end of which he d., on the very point of winning for himself a magnificent position as supreme authority in Tuscany, 1329. His death was a fatal blow to the Ghibelline party in Italy. Machiavelli's book, *Castruccio Castracani*, is more a work of imagination than a hist. of facts.

Castrum Lucii, see CHIALI.

Castrum Novum Arianorum, see CASTELNUOVO.

Castuera, tn. and com. of Spain, in the prov. of Badajoz, situated near the Guadaluja, with a trade in wines and fruit. Pop. 7100.

Casualties. In law of Scotland, 'C. of superiority,' now virtually obsolete, were certain occasional payments analogous to anc. feudal dues, paid to the superior lord by a tenant for the recognition of his tenancy. The only C. that survived until recent times were those payable to the superior in consequence of the transmission of the feu (feud or tenancy) by sale or succession to a new vassal. The payment made by an heir on taking up his estate was known as a C. of relief (Lat. *relevare*, to take up). The Conveyancing Act, 1874, makes C. fixed, and not 'casual' or accidental, payments in the absence of express stipulation to the contrary. C. such as now exist may be redeemed in payment of certain capital sums.

Casualties in the First World War (1914-1918). 1. *British Empire Casualties*: The total number of officers and men of the Brit. Empire forces who lost their lives in and through the First World War was approximately 1,089,900, of whom 1,048,850 were military C. and 41,050 were naval. These C. were distributed as follows:

Brit. Isles (including Ireland)	812,390
Indian Empire (Brit. and Indian)	73,150
Dominion of Canada	62,800
Commonwealth of Australia	60,450
Dominion of New Zealand	18,200
Union of S. Africa	9,050
Newfoundland	1,800
Colonies	52,050
Total	1,089,900

Casualties

344

Casualties

The number of wounded was approximately 2,401,000, distributed as follows:

Brit. Isles (including Ireland)	1,849,500
Indian Empire (Brit. and Indian)	84,720
Dominion of Canada	166,100
Commonwealth of Australia	154,700
Dominion of New Zealand	45,950
Union of S. Africa	17,850
Newfoundland	3,630
Colonies	78,550
Total	2,401,000

The number of prisoners was approximately as follows.

Brit. Isles (including Ireland)	170,390
Indian Empire (Brit. and Indian)	11,260
Dominion of Canada	3,730
Commonwealth of Australia	4,080
Dominion of New Zealand	500
Union of S. Africa	1,540
Newfoundland	150
Total	191,650

The total military C. (including those of the Royal Naval Div.) reported up to the Armistice (excluding the 'missing' subsequently 'presumed dead') in the chief theatres of operations were:

Theatre of Operations	Killed (including died from wounds and other causes)		Wounded	
	Officers	Other Ranks	Officers	Other Ranks
France and Flanders	36,769	612,270	87,972	1,799,122
Dardanelles	1,655	29,360	2,786	70,571
Mesopotamia	1,447	38,315	2,646	50,586
Egypt	1,186	18,969	2,377	37,838
Salonica	340	9,460	826	16,088
E. Africa	428	10,702	479	7,446
Italy	120	1,972	311	4,423

The 'missing' naturally presented a problem in a war which in the character and extent of its operations had no precedent. In so far as reliance could be placed on lists of prisoners of war, the missing who did not figure in those lists might be regarded as killed. The process of 'presuming dead' those who did not return in the course of two years after the cessation of hostilities of necessity increased the C. of the dead by a large number and, incidentally, established the reliability of the prisoner lists. There were, at the Armistice, about 130,000 cases of Brit. officers and other ranks of whom no trace had, till then, been found; but as a result of the excavation work carried on in the war areas, some 70,000

of the bodies were found during the first decade after the Armistice. In spite of the scale on which operations were conducted, it is certain that few if any cases are on record of any man returning after being officially posted as dead. A year or two after the Armistice the great majority of the 'missing' were, though not till after exhaustive inquiry, 'presumed dead,' and their names accordingly transferred to the official rolls of the dead. In some few cases death was not presumed.

Brit. naval C. (including Mercantile Marine Reserve while serving in naval ships and merchant ships, but excluding the Royal Naval Div. and Brit. Mercantile Marine losses):

	Officers	Men
Killed in action or died of wounds	2,074	20,735
Died	400	11,433
Wounded in action	549	3,961
Missing	—	2
Prisoners of war and interned	262	994
Injured	256	392

Casualties

345

Casualties

Comparative figures of Brit. and Ger. C. on the Brit. sector of the W. front during the four years of hostilities, as compiled with the aid of the Federal Archives at Potsdam, give the following results: (1) The total Brit. officer C. was 115,741; Ger. 47,256, i.e. Brit. : Ger. = 5 : 2. (2) Brit. other ranks, 2,325,932;

Ger., 1,633,140; i.e. Brit. : Ger. = 3 : 2; (3) total Brit. C. to all ranks during the period in question was 2,441,673; Ger., 1,680,396; i.e. Brit. : Ger. = 3 : 2. (See *Statistics of the Military Effort of the British Empire during the Great War*, issued by the War Office in March 1922, a detailed but incomplete document.)

2. Allied and Associated Nations' Casualties:

	Killed and Died	Wounded
France	1,393,388	1,490,000
Belgium	38,172	44,688
Italy	460,000	947,000
Serbia	127,535	133,148
Rumania	335,706	not recorded
U.S.A.	115,660	205,890
Portugal	7,222	13,751

3. Central Empires' Casualties:

	Killed and Died	Wounded
Germany	2,050,466	4,202,028
Austria and Hungary	1,200,000	3,620,000
Bulgaria	101,224	152,400
Turkey	300,000	570,000

(The figures for Turkey are approximative.)

Casualties in the Second World War (1939-45). 1. *To all ranks of the Armed Forces of the British Commonwealth and Empire, reported from September 3, 1939, to the end of the war, excluding deaths from natural causes:* This statement gives the total number of casualties reported up to Aug. 14, 1945. It includes all men reported prisoners of war and, in the case of the armed forces of the United Kingdom, New Zealand, S. Africa, and the

colonies, all men reported missing during the war. The figures exclude (i.) civilian casualties due to enemy action, (ii.) casualties to merchant seamen, and (iii.) casualties to members of the Home Guard while on duty.

The total number of officers and men of the Brit. Empire forces who lost their lives in and through the Second World War was 353,652. These C. were distributed as follows:

United Kingdom	244,723
Canada	37,476
Australia	23,365
New Zealand	10,033
S. Africa	6,840
India	24,338
Colonies	6,877
Total	353,652

The number of missing was 90,844. The figures (except for Canada, Australia, and India) include those who rejoined:

United Kingdom	53,039
Canada	1,843
Australia	6,030
New Zealand	2,129
S. Africa	1,841
India	11,754
Colonies	14,208
Total	90,844

The number of wounded was 475,070, distributed as follows:

United Kingdom	277,090
Canada	53,174
Australia	39,803
New Zealand	19,314
S. Africa	14,363
India	64,354
Colonies	6,972
Total	475,070

The number of prisoners, including service internees, was 326,459. The figure includes 20,147 officers and other ranks missing but presumed to be prisoners of war, and prisoners of war who were repatriated or liberated or who escaped:

United Kingdom	180,405
Canada	9,045
Australia	26,363
New Zealand	8,453
S. Africa	14,589
India	79,489
Colonies	8,115

Total 326,459

The figures for the United Kingdom under the four categories of C. include men from overseas serving in those forces, in particular from Newfoundland and S. Rhodesia.

2. *Casualties to Merchant Seamen reported from September 3, 1939, to the end of the war:*

Deaths	30,189
Missing	5,264
Wounded	4,402
Internees	5,556

Total 45,411

The figure for deaths includes those who d. in internment and those presumed dead in missing ships, but excludes deaths from natural causes. The figures for deaths, missing, and internees include men of all nationalities who served in Brit. registered ships and fishing boats, and Brit. subjects who served on foreign ships requisitioned or chartered by His Majesty's Gov. during the war. The figure for internees includes those who were repatriated or who escaped.

Casuarinaceæ, Australian order of Dicotyledons containing the single genus *Casuarina*. The species are trees somewhat resembling the *Equisetum* in appearance, the branches being all long, drooping, green, and wiry, with channelled interodes and very small, scale-like sheaths in place of leaves. The flowers are in male and female catkins, the male flower consisting of a single stamen and two perianth-leaves, while the female consists of two syncarpous carpels, which form a unilocular ovary. The stamens and styles both hang out over their bracts and are wind-pollinated. The male flowers are borne in terminal spikes and the females resemble a pine-cone in appearance. The wood of the plants is called beef-wood, and young shoots afford fodder for cattle.

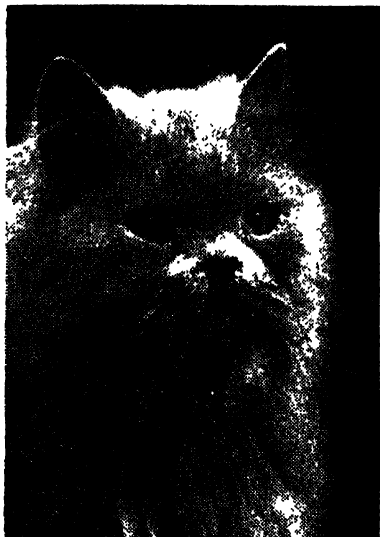
Casuarium, see **CANSOWARY**.

Casuistry (Lat. *casus*, instance, point of law), art of bringing moral principles to bear in particular cases—applied morality. From the seventh to the eleventh century *The Penitential Book* was used as a guide for conscience. Moral theology began with the schoolmen of the thirteenth century. The *Secunda Secundæ* of Thomas Aquinas is a well-known work on moral theology but too scientific for general use. The science was largely developed by the medieval Church in the fourteenth and fifteenth centuries. See Pascal, *Les Lettres Provinciales*, 1656-57; H. Sidgwick, *History of Ethics*, 1892; H. Rashdall, *Theory of Good and Evil*, 1907.

Casus Belli (Lat. cause of war), grounds which, by international law, are sufficient for declaring war. The causes for war were strictly defined, so that war might be used as the last extremity in conflicts between nations. See **INTERNATIONAL LAW**; **HAGUE CONFERENCE**.

Cat, in general, any member of the mammalian family Felidae, including the lion, tiger, panther, leopard, lynx, jaguar, etc., but the name is more usually limited to the smaller species. Cs. are typical felinoid carnivores, distinguished by wonderful flexibility and strength of spine, perfect mechanism of the claws, a small, supple head, looseness of skin, swiftness of movement, grace, and muscularity. They are mostly splendid climbers and jumpers. They have thirty teeth, rough tongues, and long whiskers or feelers *vibrissæ*, to assist the eyesight at night. The pupils of their eyes expand and contract according to the light about them. The original abode of the domestic C. (*Felis domestica*) is not certainly known, but it is probably descended from the *Felis caffra* of auct. Egypt, which was worshipped at a very early period as an object of veneration, and not from the fierce, wild *Felis calus* of Europe. Cs. are more prone than dogs to revert to a wild or semi-wild state, but no true wild species exactly resembles them. They are hardly mentioned in auct. writers of Greece, Rome, or Judæa, and it is known that in the earlier medieval period of Europe Cs. were rather rare and costly. They have been long known in China (from 500 A.D.), whence comes a fine variety with soft, beautiful fur and pendulous tufted ears. The Manx, with merely a rudimentary tail, is supposed to have come from Japan, but is also called the Cornish C. In the widest sense the C. section (Felinoidea) of carnivores includes, besides Felidae, civets (Viverridae), aardwolves (Proteridæ), and hyenas (Hymenidæ). Of domestic Cs. the most fancied breed is the long-haired (Persian). The most valued are of a very uniform pale silver or chinchilla colour, without marking or shading, and with green eyes, but to-day the championship award generally goes to a blue or cream, while the blue bring the highest prices and command the highest fees. Blue Persians should have deep orange or amber eyes. Other popular varieties are pure whites with blue eyes, deep coal-blacks with dark yellow eyes, red tabby,

Siamese (fawn), brown tabby, and silver tabby. They may also be tortoiseshell or smoke colour. Markings are an important point in judging short-haired varieties. Usually there is little difference between males and females. Pure sandy Cs. are nearly always males. All except the lion are monogamous. They are difficult to train and inclined by nature to be treacherous. Anger is shown by lashing of the tail, pleasure by a deep, rumbling purr in the throat. Russia, Iceland, India, Madagascar, and Abyssinia all have fine breeds of domestic C.



BLUE PERSIAN

T. Fall

Notable varieties are the Angora (long-haired), Maltese and Chartreux (bluish-slate colour), Siamese (pale cream, with feet, lower legs, muzzle, and ears all black), and the Paraguay domestic C. of America. As a race Cs. are not gregarious or co-operative, but prefer to live or hunt alone (see Kipling's *Just So Stories*, 'The Cat that Walked by Himself'), or in small family parties. The small species (especially the *Felis domestica*) have young very frequently, often as many as four or five at a birth. For about ten days after birth a kitten's eyes remain unopened. The eyes are always blue at first changing gradually later on to green or yellow in most varieties. Cs. soon grow attached to particular spots or corners of a house. They are good mousers if not spoilt by too much petting. Most kinds are not very affectionate. In Persians the kittens' playfulness gives place to extreme dignity. Cs. should be given two meals a day; the diet consisting of meat, rabbit (cooked or uncooked), cooked fish,

or fowl, bread scraps soaked in milk, and green vegetables. Cooking of certain meats or offal is necessary because of the possibility of worm infestation. Small bones should be avoided. Water should always be available for the C., and it should have at least two drinks of milk daily. Cs. are subject to numerous ailments, but care and attention to diet may keep the animal free of them. Among the more serious are canker of the ear, diarrhoea, inflammation of the bowels, influenza, mange, and worms. The methods of treatment are described fully in the pubs. of the manufacturers of C. medicines, but in serious cases a veterinary surgeon should always be consulted.

Shows. The earliest C. show in Britain was at the Crystal Palace, 1871; the first in Scotland soon after in Edinburgh. The National C. Club was instituted under Weir's presidency, 1887. Its ann. exhibition is usually held in autumn. The Scottish C. Club, formed 1894, holds an ann. show in Edinburgh or Glasgow. Besides the National C. Club shows, the shows recognised in England for championship purposes are those held at Newbury and Croydon, the Midland Cos. show held at Worcester, Malvern, or Cheltenham, and the S. Cos. show. The Siamese C. Club (founded 1901) holds a championship show each autumn in London. See I. M. Mellen, *A Practical Cat Book*, 1939; M. H. Clarke, *First Aid to Dogs and Cats*, 1941; M. Joseph, *Cat's Company*, 1916; P. M. Soderberg, *Cat Breeding and General Management*, 1948.

Cat, Christopher (fl. 1702-33). Keeper of the Cat and Fiddle Inn, London, and, subsequently, of the Fountain Tavern, in which the Kit-Cat Club held its meetings, 1703-20.

Catabrosa, inconspicuous genus of Gramineæ which grows in temperate countries. There is only one Brit. species, the whorl-grass, *C. aquaticus*, found in ponds, ditches, and wet sands.

Catacos, tn. of Peru, S. America, in the prov. of Piura. Pop. 4000.

Cataclysmal Action, theory of world hist. in vogue among geologists in the early part of the nineteenth century and thereafter, to account for the revelations which had been made with regard to fossil remains. It attempted to explain the great differences in the fossiliferous remains in consecutive beds by assuming violent catastrophes which swept over the earth, killing the inhab. and altering its character. The theory is now abandoned, and the uniformitarian theory brought forward by Lyell, in which the course of events has been similar to those of modern times, takes its place.

Catacombs (Gk. *κατά*, down, and *κόβη*, a hollow), excavations forming subterranean galleries for the burial of the dead. The original term, *catacumbæ*, was at first applied to a particular burial place only—that of the basilica of St. Sebastian—and the word did not refer to the excavations for the tombs, but to the conformation of the ground in the locality. The full title of this burying-place was *cimiterium ad catacumbas* (the burial

place in the hollow), often shortened to *catacumbas*. In time the term became applied to all burial places in general, and so, in the ninth century, to the *crypta* or *cemeterium* of the Christian vaults now known in England as the *catacombs*. There are C. in many places, but the most remarkable are those of Rome. These are the C. of the Christians, and the earliest belong to the second century, though by far the greatest number belong to the third and fourth. After the fourth century inhumation in C. became more and more rare, burial in

sixteenth century the reading of ancient writings brought about by the Renaissance turned people's attention again towards the C. and in 1578 they were accidentally rediscovered by Padre Bosio. This 'Columbus of the subterranean world' devoted thirty years of his life to exploring them, working out their plan, and restoring and studying their monuments. He wrote an account of his work in *Roma Sotterranea*. Ever since the C. have been the object of curiosity to millions, and the work has been continued by Aringhi and Boldetti in the seventeenth century,



A NICHE IN THE CATACOMBS AT ROME

E.N.A.

churches taking its place. But the great respect of the Christians for the dead caused the C. to be still held in extreme reverence; people continued to visit them in remembrance of their dead, and to do homage at the tombs of the martyrs. There remain curious notices to visitors, itineraries of pilgrimages, etc., belonging to this time. The faithful took with them precious perfumes, which they poured through the cracks at the top of the martyr's tomb, and of which they carefully collected again every tiny drop as it passed through the cracks at the bottom, after having touched the body of the saint. With the invasion of Alaric in A.D. 410, this cult ceased, the C. sharing in the general devastation. Indeed, at this time many of the holy relics were removed and deposited in the various churches for greater safety. There was, therefore, no longer any reason to visit the C.; all trace of them was lost and they were forgotten. Towards the end of the

seventeenth century the reading of ancient writings brought about by the Renaissance turned people's attention again towards the C. and in 1578 they were accidentally rediscovered by Padre Bosio. This 'Columbus of the subterranean world' devoted thirty years of his life to exploring them, working out their plan, and restoring and studying their monuments. He wrote an account of his work in *Roma Sotterranea*. Ever since the C. have been the object of curiosity to millions, and the work has been continued by Aringhi and Boldetti in the seventeenth century,

surmounted by an *arcosolium*, served the early Christians as a model for these tombs. At various distances—sometimes 300 paces—are vertical shafts for light and air. The *loculi* were closed by slabs of marble or huge tiles, and cemented with great exactness. On them was painted or incised a name and a date, with sometimes one or more of the Christian symbols, a dove, an olive-branch, or the sacred monogram. The *cubicula* were decorated with simple fresco-paintings, a curious mixture of pagan and Christian traditions forming the subjects. The chambers were family burial places, or contained the tombs of martyrs. The C. are entered from churches above them, and sometimes from simple openings in the ground. The old belief that the C. were secret places of worship of the early Christians is true only to a limited extent. There was no need for secrecy except during the fiercest of the persecutions when Christian worship was penal. There is every evidence, indeed, that at those times they were used for congregational worship. As places of refuge for any number of people or for any length of time, the C. must always have been impossible, though a hunted refugee may occasionally have found safety there. It appears to be established that the C. were entirely the work of the early Christians, and not disused sand quarries, as was once believed. The strata quarried for building purposes were quite unsuitable for the construction of C., which required strata of the hard volcanic rock. Among the more famous of the C. outside Rome are those of Naples, Syracuse, Palermo, Tuscany, Etruria, Malta, and Alexandria. The C. of Paris are improperly so called—they are mere charnel houses.

Catafalque (Fr., from It. *catafalco*, a word of unknown origin), temporary draped structure, representing a cenotaph, used for the lying in state and for the funerals of royalty and notable persons.

Catalan, group of the Romance languages, spoken to-day by over 3,000,000 people in the provs. of Gerona, Barcelona, Lérida, Tarragona, Alicante, Valencia, and Castellón de la Plana, Spain; in the Fr. dept. of Pyrénées Orientales; in the Balearic Is.; in the dist. of Alghero, Sardinia; and in parts of the Argentine Republic. C. dates from the thirteenth century, and closely resembles Provençal. During the fourteenth century it came to be regarded as a literary language, and still attains to that dignity, the revival of *jocs florals* at Barcelona in 1859 having aroused much popular enthusiasm. The greatest C. poet of the fifteenth century was Ausias March, who wrote beautiful *Cants d'amor* and *Cants de mort*. Of modern poets, Balaguer and Perdaguer are chief. Among the prose writers are Ramon Llull (Raymond Lully), Muntaner, and Desclot. *Consull* M. Mila y Fontanals, *Estudios de lengua catalana*, 1875; and Morel-Fatio, in Gröber's *Grundriss der romanischen Philologie*, 1888.

Catalani, Angelica (1779-1849), famous It. singer who was the daughter of a tradesman, and was educated at the

convent of Santa Lucia at Gubbio. Her glorious voice soon attracted attention, and she made a tour of Europe, receiving enormous fees, which were soon squandered, through the extravagance of her husband, Capt. Valabregue. Her first appearance in London was in 1806 and she remained in England, a prima donna without a serious rival, for seven years. It was she who introduced to the Eng. stage Mozart's *Nozze di Figaro*, in which she played Susanna to perfection. Her refusal, however, to allow other singers to share in her popularity meant that, during her management, opera in London was, for a time, ruined—for one singer does not constitute an opera or, recalling her husband's cynical affirmation: 'Ma femme et quatre ou cinq poupées—voilà tout ce qu'il faut.' She later obtained the management of the Théâtre Italien in Paris, together with a large subvention; but, on Napoleon's return, she left Paris and toured a number of European cities arousing the wildest enthusiasm. Later she returned to the Théâtre Italien in Paris, but followed the same ruinous system there which had temporarily eclipsed the opera in London. Every expense on orchestra, other singers, and scenery was cut down so that the receipts might go, together with the subvention, into the hands of her husband. To suit this state of things the operas were arranged in such a way that little of the original save the name survived; while the rest consisted of variations by Rode, and similar items, with the celebrated *Son regina* introduced instead of the concerted pieces and songs which had been excised. But though she came to financial grief over the Paris opera house owing to her husband's carelessness, she was unquestionably one of the famous operatic stars of all time with a voice of singular purity and power. She gave up public life in 1828. She was most liberal and generous in her subscriptions to charities and withal a woman of fine character.

Catalaunian Fields or Plain, scene of the battle in which Attila, king of the Huns, was defeated by the forces under the Rom. general Aetius in A.D. 451. The plain is generally thought to have been situated round Châlons-sur-Marne, in the old prov. of Champagne, France, but some authorities place it round Metz.

Catalectic Verses are such as are lacking a syllable in the last foot. Putterham called them 'maimed' verses. See ACATALECTIC.

Catalepsy (from the Gk. *καταληψις*, seizure, or a taking possession of), term applied to a nervous affection, in which the patient becomes insensible, and there is a sudden suspension of all voluntary motion, the body becoming rigid and fixed, and so remaining until the end of the attack. In some cases there is complete insensibility, so that the person appears to be dead. In other cases the patient appears to be labouring under great mental excitement, and gives utterance to vehement ejaculations, or will even break out into song. The duration of the

attack varies; sometimes the patient recovers after a few minutes, sometimes after sev. hours, but in more serious cases the attack will run into weeks or months. In this case forcible feeding has to be administered, otherwise the patient would starve. C. is a complaint to which very sensitive people, women more especially, are prone, and the attack is usually occasioned by some great stress of emotion, whether depression of spirits, mental excitement, or religious emotion. In the last case it assumes the form of a trance or ecstasy. Swedenborg's trances were undoubtedly a kind of C. This complaint is also associated with hysteria, and does not necessarily mean mental derangement structurally, although it does happen that C. is sometimes one of the symptoms of madness. It belongs to the class of those nervous disorders in which the various organs refuse to perform their functions owing to the abnormal physical and psychic state of the patient. There is a good deal of imposture practised in this particular affection; at the same time, epidemic C. has been known to occur in which many people are affected at the same time. Moral means form a large part of the treatment as in the case of hysteria. C. is a type of schizophrenia. Fixation of the limbs in any position they are made to assume, and insensitiveness of the whole body to pain, are characteristic features of the condition.

Catalogue, in astronomy, the name given to a list of stars, to which is added the means of determining their positions, whether lats. and longs., or right ascensions and declinations. Such a C. not only forms a register of the stars in question, but also gives the means of computing the effects of precession, aberration, and nutation. The position of the star in the heavens at any given time can thus be computed. Another kind of C., such as a C. of comets, is concerned with purely physical investigations, such as double stars and nebulae.

Catalogues and Cataloguing (Gk. *κατάλογος*, register, from *ταράττειν*, to enrol, pick out), list or enumeration, generally in alphabetical order, of persons or things (sale C., picture C.), especially of the contents of a library or museum. Library C. of a kind have existed since the earliest times and the modern library catalogue is but an extension of the C. of the medieval libraries and of the lists compiled by the first booksellers. The making of C. and bibliographies is a most important branch of literary work; the catalogue is the list of books gathered together in one library; the bibliography is the list of books written on any subject regardless of their actual location. The value of a literary collection may largely depend on good C. to make it of practical assistance. To meet ordinary reasonable demands two C. are essential, one arranged by authors one by subjects. Some libraries have various other C., such as title C., and lists besides. The catalogue entry for each book has three distinct parts: (1) Author; (2) Title proper; (3)

imprint and collation, with various bibliographical details. C. are usually typed nowadays instead of being printed or written by hand, and the book form is largely being replaced by the card or sheaf catalogue, as this is more convenient when additions to or withdrawals from the entries are made. The separate cards generally stand on edge in drawers or trays; the sheaf entries are held in loose-leaf binders. Additions and withdrawals can be made to either card or sheaf C. at any time, thus ensuring that the catalogue is always up to date. Most libraries now compile their C. either in dictionary or classified form irrespective of whether the C. is on cards or in sheaf form. The dictionary C. arranges in one alphabetical sequence the author, title, and subject entries, whilst the classified form is arranged according to the classification symbol taken from the book classification system in use in the library. With a classified catalogue there are obvious advantages, as a logical arrangement of subjects is assured, the catalogue being based on a system which shows what books are grouped together on the shelves, whereas the dictionary arrangement is purely fortuitous. The first to make definite scientific rules for compiling book C. was Panizzi in 1839. In that year appeared his 'ninety-one rules' to be observed in making the library catalogue for the Brit. Museum. Every book was to be catalogued from information contained in itself; exact rules as to the entry of the author's name, the title of the book, and imprint details are laid down. These rules have since been modified to meet the important principle that under any author's name all the eds. of his works should appear in a single list. The revised Brit. Museum rules were reprinted in 1936. The general catalogue of the Brit. Museum is arranged under authors. Subject indexes are pub. periodically by the Brit. Museum in which subject headings are in alphabetical order. Most public libraries and others use an author catalogue based on the Anglo-Amer. code rules or on the Brit. Museum rules, and also a subject catalogue which is arranged according to the book classification system adopted by the library. Of subject classifications, that of J. D. Brown was devised in 1894. Subjects are grouped in an evolutionary order, and the main divs. are matter and force, life, mind, and record; it is a simple system, complete and capable of expansion. Very few libraries, however, use this scheme. The best known modern book classification system is Dewey's 'decimal classification,' and a later, but little used, scheme is Cutter's 'expansive classification.' The decimal classification was drawn up by Melvil Dewey in 1876 (14th revised ed., 1942). Dewey divides subjects into ten groups: general works; philosophy; religion; sociology; languages; pure science; applied science; fine arts and crafts; literature; travel, hist., and biography. Each group is divided into ten sections, and these are again subdivided. The fourteenth ed. of Dewey's

system appeared in 1942 and a recent survey showed that 97 per cent of the libraries in the United Kingdom and the U.S.A. use this system. C. A. Cutter pub. his book *Expansive Classification* in 1891. It is defined as consisting of 'seven tables of classification of progressive fullness designed to meet the needs of a library at its successive stages of growth.' Each progressive table is subdivided with greater detail. The universal decimal classification is an adaptation and expansion of Dewey's scheme. The Institut International de Bibliographie at Brussels, now known as the International Federation for Documentation, adopted the scheme in 1895 for the purpose of arranging its enormous card bibliography. Three important libraries using this scheme are the Science Library in London, the Engineering Sciences Library in New York, and the Verein Deutscher Ingenieure in Berlin. The Library of Congress, the national library of the U.S.A., has constructed its own classification system, and although no thought was given by its authors to its adoption by other libraries, many univ. libraries are to-day using this scholarly scheme. Two recent classification systems, although not yet widely known, should be mentioned: the Amer. system of H. E. Bliss—a system of bibliographical classification—and the Indian colon scheme of S. R. Ranganathan. See M. Dewey, *Decimal Classification*, 1876, 1942; C. A. Cutter, *Expansive Classification*, vol. 1: The first six classifications, 1891-93; J. D. Brown, *Library Classification*, 1912, 1939; W. C. B. Sayers, *Manual of Classification*, 1926, 1941; H. E. Bliss, *A System of Bibliographic Classification* (2nd ed.), 1936; S. R. Ranganathan, *Colon Classification* (2nd ed.), 1939; H. Sharp, *Cataloguing* (4th ed.), 1948. See also the *Cataloguing Rules* compiled for the Library Congress, 1906, and for the Library Association and the Amer. Library Association, 1908; and the Brit. Museum Rules, revised 1936.

Catalonia (Sp. *Cataluña*), formerly a prov. of Spain; contains the four provs. of Barcelona, Tarragona, Lérida, and Gerona. It occupies an area of 12,288 sq. m. in the N.E. corner of the Iberian peninsula with a pop. of 2,961,500. The surface of the country, which is much broken up by spurs of the Pyrenees, slopes gently down to the coast, and is drained by the Rs. Ter, Llobregat, Noguerra, Segre, and Ebro, none of which is navigable. The climate is generally healthy, temperate, and favourable to vegetation. The orange, fig, vine, pomegranate, myrtle, thorn-apple, esparto and heaths, maize, millet, rye, flax, liquorice, nuts, almonds, and other fruits grow easily. Goats and swine are reared, but there are no sheep, and hardly any cattle. C., which was probably peopled originally by Iberian races, has been much invaded by foreign settlers. It was one of the first Rom. provs. in Spain, and the country is full of Rom. remains. The Romans were followed by the Goths and Alans, the Arabs, Charlemagne and his troops, then

by Louis the Pious of Aquitaine, who placed the dist. under independent Frankish lords, after driving out the Arabs. Since then the country has been alternately independent and annexed by Spain. Always, however, the Catalans demanded their independence. This political movement was stimulated by what may be called a renaissance of the local spirit in the nineteenth century, provoked by a revival of the study of the Catalan language and literature. The language has great affinity with the Provençal, and is a neo-Lat. dialect. The Catalans are revolutionary and warlike, frugal, industrious, enterprising, and energetic, differing in dialect, costume, etc., from the other inhab. of Spain. In the Sp. revolution of 1931, the Madrid gov. was morally compelled, after the monarchy had fallen, to allow C. to use its own language, flag, and anthem, while, however, continuing to acknowledge the overriding authority of the Sp. republic. C., however, then drew up its own provisional constitution and, finally, the Sp. Gov. gave way and delivered the Statute of Autonomy to C. (Sept. 1932), the new Catalan Cortés or Parliament being formed soon afterwards. After a rebellion in 1934 the Sp. Gov. suspended the Statute of Autonomy for an indefinite period. During the Civil war (1936-39), C. stood firm on the gov. or republican side and an autonomous gov. was again instituted in C. in Aug. 1936. The whole of the provs. offered a stout resistance to Gen. Franco's Nationalist forces in 1938, but with the fall of Borjas Blancas in the offensive of Nov.-Dec. 1938 and the threat to Tarragona, C.'s fate was sealed. With the help of It. forces and by extensive aerial bombardment, Franco broke into the heart of C. and, by driving a salient through the Republican forces to the sea, cut C. off from the Valencia Gov. On Jan. 26, 1939, Barcelona fell, and by Feb. the whole of C. was in the hands of the Nationalists, their advance being preceded by the flight of tens of thousands of refugees, in pitiful plight, across the Fr. frontier.

Catalpa, genus of Bignoniaceae, occurs in Asia and more abundantly in N. America. *C. syriaca* is a native of the S. states of America, where it gains a height of 40 to 50 ft. along the banks of rivs. The flowers are large, trumpet-shaped, and white, variegated with yellow and purple; when it reaches a great height the branches become too long and naked and spoil the appearance of the tree. *C. bignonioides* grows as an ornamental tree in Britain and yields durable timber; *C. longissima* contains much tannin in its bark.

Cataluña, see CATALONIA.

Catalysis, term introduced by Berzelius to express the acceleration of the rate of a chemical reaction produced by some substance which is itself not permanently changed by the reaction. The terms positive C. and negative C. are sometimes used to express acceleration and retardation of the rate of reaction. In some instances it is certain that the

catalyser undergoes some change in the course of the reaction, being reconverted into its original form before the end of the process; in other cases no change at all is apparent. An example of the former class is provided by the part played by manganese dioxide when oxygen is obtained by heating a mixture of that substance with potassium chlorate. Some of the chlorate reacts with the manganese dioxide to form potassium permanganate, chlorine, and oxygen; the chlorine then reacts with the permanganate to form potassium chloride, manganese dioxide, and oxygen, these being the ultimate products of the reaction: In the acceleration of the combustion of hydrogen and sulphur dioxide in the presence of finely divided platinum, the metal does not appear to change at all during the reaction. Many other metals act as catalysers in certain reactions, with results which have very great commercial value. If acetylene mixed with hydrogen be passed over finely divided nickel, the gases condense to a yellow liquid resembling petroleum. A process by which the combination of sulphur dioxide and oxygen is brought about by the catalytic action of platinum is used in sulphuric acid manuf. No completely satisfactory theory of C. has yet been elaborated. C. is playing an increasingly important part in chemical industry, e.g. in the manuf. of edible fats from whale oil, cotton-seed oil, etc., and in the synthesis of methyl alcohol.

Catamaran (from a Tamil word derived from *catta*, to tie, and *marana*, wood), name given to a vessel or raft used by the Hindus of Madras. It is formed of three logs lashed together. The central log is longest, with a curved surface at the fore-end which terminates in a point. It is from 20 to 25 ft. long, and is managed by two men, who squat upon it and work paddles. The special use of the C. is that it can pierce through the surf on the beach at Madras, and so reach a vessel in the bay when any other kind of boat would founder.

Catamarca: 1. N.W. prov. of the Argentine Republic, being bounded on the W. by the Andes and on the E. by the Sierra Aconquija. The country is mountainous, with short streams and many salt lakes. The valleys are fertile, and produce red pepper, tobacco, and all kinds of grain and fruits. Copper is found in great quantity, many minerals are mined, including gold, silver, iron, and lead. Pop. (largely Indian) 145,200. 2. Cap. of the above prov., on the Rio del Valle, 250 m. N.W. of Córdoba, with which it is connected by rail. It has a Franciscan monastery, a national college, and a normal school for women. Weaving is the chief industry. Pop. 22,000.

Catamount, see PRIMA.

Catanduanes, or Katanduanes, is. of the Philippines, part of the Albany prov., Luzon, from the E. coast of which it is separated by the Maqueda Channel. Area, 710 sq. m. Length, c. 38 m. It is a fertile is., producing maize, rice, abaca,

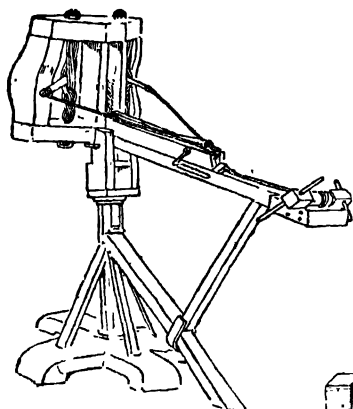
sesame, cotton, corn, indigo, etc. The chief tn. is Biraç. Pop. about 34,000.

Catania, name of a prov. and its cap. tn. on the E. coast of Sicily. It is everywhere mountainous, and is watered by the Giarretta and its numerous affluents. It forms the beautiful plain of C., the most fertile dist. in Sicily. The tn. is situated at the foot of Mt. Etna, near the mouth of the Giarretta. Its former port is now blocked up by lava. C. is a city which is always being destroyed and is always rising again upon its own ruins and upon lava. This accounts for its modern appearance. It was devastated by eruptions and earthquakes in 1669, 1693, 1818, and 1873. Its immediate environs are very desolate, the country being covered with lava and black sand; beyond is the fertile plain which yields grains, the vine, fruits, and vegetables in extraordinary profusion and excellence of quality. The tn. was founded by Gk. colonists in 728 B.C., became a Rom. colony—Catana—in the reign of Augustus, was occupied successively by the Goths, Vandals, and Saracens. In the Second World War C. was the scene of heavy fighting during the allied invasion of Sicily in 1943, and the tn. of C., being a key point in the so-called Etna line—the Ger. defence line from C. to San Stefano—was subjected to bombardment and air attack. The tn. was eventually captured by the Eighth Army on Aug. 5, 1943. The damage was heavy. The roof and windows of the cathedral were damaged, as also were the roof and windows of the collegiate church and of the Minorite church. Other churches seriously damaged were San Benedetto, San Dominico, San Francesco, and San Rosario. Pop. (of prov.) 686,000; (of tn.) 228,000.

Catanxaro: 1. Prov. of S. Italy, formerly called Calabria Ulteriore I. It is bounded by the Mediterranean on the W. and the gulf of Taranto on the E. There is excellent pasturage; vine, olives, and fruit are cultivated. Area, 2030 sq. m. Pop. 573,000. 2. Cap. of the above prov. It is an episcopal city, situated on a mt., 8 m. from the gulf of Squillace. There are the ruins of an old castle and a cathedral. Many of the prin. buildings were destroyed by an earthquake in 1783. There are fine olive groves; the chief industry is the manuf. of silk and velvet. The cathedral was severely damaged in the fighting of 1943, but it was not considered to be of sufficient monumental importance to justify repairs through the Monuments, Fine Arts, and Archives Sub-commission of the Allies. Pop. 44,000.

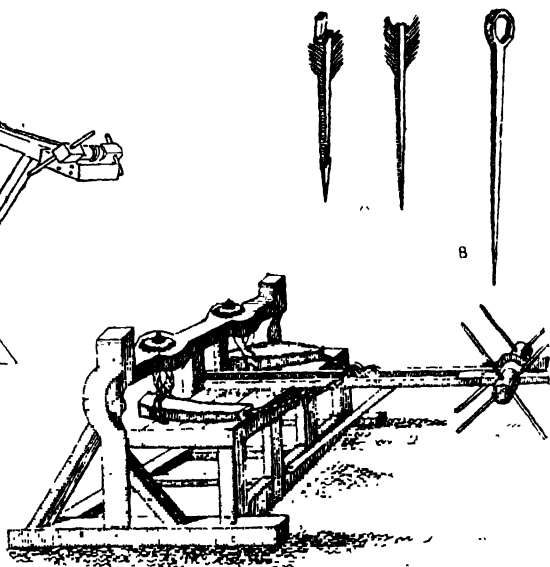
Catapult (Gk. *katá*, down, and *πάλλειν*, to hurl), anct. military engine for throwing stones, arrows, and darts. Some say that it was invented by the Syrians in 200 B.C., others that Dionysius, the tyrant of Syracuse, invented it in 399 B.C. It was used by the Gks. in the time of Philip, king of Macedonia, by the Carthaginians, and by the Romans. It disappeared at the beginning of the Middle Ages.

The C. had a bow of wood or steel, which was bent by means of a windlass.



FORMS OF
CATAPULTS

A, darts; B, which for
binding the catapult.



'Picture Post' Library

the cord being finally released by a spring.
See also BALLISTA.

Cataract, disease of the eye caused by the clouding of the liquid contents of the crystalline lens. This is situated with its anterior surface 3.6 mm. behind the anterior surface of the cornea and is the prin. image-forming part of the visual apparatus; the alteration of the curvature of its anterior surface giving accommodation, i.e. focusing for objects at varying distances. The cloudiness which is caused by lack of nutrition occurs at all ages, but more often in the cases of old people and young children. It is sometimes present at birth, exists in connection with some general diseases such as diabetes, in senile decay, or when the eye is subject to local injury caused by a blow. Heredity plays little or no part in its formation. It is painless and unaccompanied by inflammation. One eye is often affected alone, and blindness is caused for all general purposes, but the patient is able to distinguish light from darkness. The lens itself is not homogeneous, but consists of numerous concentric layers increasing in density from the outer to the central portion, the whole being encased in a transparent capsule. The formation of the C. is gradual, either starting from the centre or from the edges, and when it has covered the whole of the lens, the latter is filled with a homogeneous pearly white or amber-coloured opacity. In its early

stages it is seen by the ophthalmoscope invented by Helmholtz for examining the interior of the eye. C. may be either hard or soft; the latter, however, is the general condition for cases occurring in young people. Treatment must consist of an operation. As a palliative, however, a mydriatic such as atropine increases the opening of the pupil and so allows more light to reach the retina; but it is no cure, and has no power to arrest the progress of the malady. The operation can be performed by means of a puncture of the lens by a fine needle passed through the cornea at the margin and stirring the lens contents, when the substance of the lens passes into the aqueous humour of the eye and dissolves. This form of operation is generally performed on soft C. When the lens is hard it is extracted entire. With a narrow knife an incision is made in the upper part of the cornea at its junction with the sclerotic, the lens, with or without its capsule, is taken out, the cut edges put together, and the eye bandaged. In either case strong convex glasses must be worn after the operation to replace the missing lens. Some cases of operation for C. are unsuccessful, because the retina also is diseased.

Catarmán, pueblo on the N. coast of Samar, Philippines, at the mouth of the C. R. The tn. was partly destroyed by a volcanic eruption in 1871. Pop. c. 10,000.

Catarrh, inflammation of the mucous

membrane, accompanied by a more than usual discharge of mucous fluid from it. In an ordinary cold the membrane of the nose and upper part of the throat is inflamed. The inflammation may affect the larynx, causing temporary loss of voice, or travelling to the lungs it may set up bronchitis.

Catarrhini, name sometimes given to a group of monkeys which comprises the families Cercopithecidae (baboons, macaques, etc.) and Simiidae (anthropoid apes). They differ from the Platyrrhini, which comprises the remaining two families, the Hapalidae and Cebidae, chiefly in having their nostrils close together and looking downward as opposed to those looking outward and separated by a broad cartilaginous septum. The C. moreover, have often ischial callosities or patches of brightly coloured skin on the buttocks, cheek pouches, thirty-two teeth, and their tails when present are never prehensile. The other species have thirty-six teeth, no ischial callosities or cheek pouches, and their tails are frequently prehensile. The former are denizens of the Old, the latter of the New World.

Catarroja, tn. of Spain, in the prov. of Valencia, and 6 m. S. of the city of that name. Fishing and the cultivation of rice are the chief industries. Pop. 8000.

Catauxi, warlike, cannibal tribe, living in W. Brazil. They go naked, and wear bangles and anklets. The men are very handsome, with fair complexions, and are extremely strong. They mould and ornament pottery and cultivate manioc extensively.

Catawba, name given to the grape and the wine expressed from the grape of *Vitis Labrusca*, the fox-grape of N. America. The fruit is dark red and very sweet, and the wine is light, with a rich musky flavour, and may be either still or sparkling. Its name is taken from the C. R. of the Carolinas, on which it is said to have been first cultivated.

Catbalogan, pueblo of the Philippines, cap. of the prov. Samar. It trades chiefly with Manila, over 300 m. to the S.E., the prin. exports being coco-nut oil and hemp. Pop. 8000.

Cat-bird, popular name of two very different species of birds which resemble one another only in that they emit a curious mewing sound. One of these, *Elanoides forficatus*, is an Australian bird closely allied to the bower-birds; the family to which it belongs is the Pardalidae. The other is an Amer. member of the family Turdidae, is related to the mocking-bird, and is called technically *Galeoscoptes carolinensis*. The colouring of the two is also different, the former being a bright green, the latter a slate-grey.

Catch, round in which each singer in turn catches up, as it were, the words from his predecessor and which is so contrived that this catching at each other's words distorts the sense, giving it a humorous or an absurd turn.

Catchfly, name applied to many species of the caryophyllaceous genera *Lycnis*

and *Silene* which are very common in N. lands. They obtain their name from their ability to catch insects by means of a glutinous substance which is exuded from the calyx and glandular hairs on the stalks. In both genera the calyx is gamosepalous and the stamens are ten in number, but in the genus *Silene* there are only three styles, while *Lycnis* has five styles and five carpels. *S. nutans*, the Nottingham C., is a night-flowering species, common in meadows, and is pollinated by moths; *L. viscosa*, clammy C., and *L. viscaria*, Ger. C., are European species with protandrous flowers which are pollinated by bees, butterflies, and moths. *S. maritima*, seaside C., has fleshy leaves; *S. rotundifolia*, round-leaved C., and *S. antirrhina*, snapdragon C., are Amer. species. *Dionaea muscipula*, the Venus's fly-trap, which belongs to the Droseraceae, is sometimes called the Carolina C.

Catching Bargain (also **Snatching Bargain**) means a purchase made from an expectant heir of his reversionary interest in real or personal property for an inadequate consideration. The law was formerly very stringent in setting aside such bargains, but mere undervalue will not now operate to nullify 'a bargain if made in good faith and without fraud or unfairness'.

Catchment Area, area in which water from rainfall, springs, etc., collects to form the supply of a riv., stream, or drainage area. The boundaries of a C. A. are the heights or ridges of land which divide it from another drainage area. A certain proportion of the rainfall is always lost by evaporation and absorption. The 'run-off' is that water which actually reaches the stream or riv. Also called a catchment basin.

Catchpoll (Low Lat. *chassipullus*, lit. 'chase-chicken'), obsolete term of reproach used to denote the assistant of a bailiff whose duty it was to make arrests. It was also used to mean a tax-gatherer.

Cateau, Le, Battle of, name given to the action fought on the W. front in the First World War on Aug. 26, 1914, during the retreat of the Brit. forces before the Ger. invasion of Belgium and France. The Brit. forces comprised the 3rd, 4th, and 5th Divs., or 2nd Army Corps, under the command of Maj.-Gen. Sir Horace Smith-Dorrien. The battle resolved itself into a desperate resistance by one half of the Brit. Army temporarily cut off from the other half, against a Ger. attack by no fewer than seven Ger. divs., backed by a superior force of artillery. In view of the Ger. pressure, Sir John French, the Brit. commander-in-chief, abandoned his plan of holding a position behind the Le C. road, preferring to withdraw further, towards the Roisel-Saint Quentin railway. He therefore ordered the two corps commanders, Sir Douglas Haig and Sir Horace Smith-Dorrien, to conform to this change of plan. Haig accepted, but Smith-Dorrien's situation was too precarious to permit him to do anything else but face the Gers. No support from the 1st Corps being

possible, his three divs. had to make the best of a situation which, on paper, seemed to point to annihilation. The sole protection to the flanks, which for the rest were practically 'in the air', was four cavalry brigades at Le Souplet and Scranvillers, the latter under Maj.-Gen. Allenby. The precise location of the battle was near Troisvilles, thence N. of Audencourt, Hautcourt, and N. of the Cambrai-Saint Quentin railway. The battle was, for the most part, an artillery duel, in which the Brit. guns were outnumbered by five to one. The Brit. guns were directed against the Ger. infantry, which was observed massing about a mile away and always advancing in successive waves, so that it presented a fair target, and must have suffered great losses from the Brit. shrapnel. After six hours' continuous bombardment, many of the Brit. batteries were out of action, and a couple of hours later the right flank of the 5th Div., under Sir Charles Ferguson, was turned, and the enemy were pouring through the gap between the two army corps. Smith-Dorrien then ordered a general retirement, which was effected in as good order as possible. Two battalions, however, the 2nd Battalion King's Own Scottish Borderers and the 2nd Battalion King's Own Yorkshire Light Infantry, either misinterpreted or ignored the order to retire and, continuing their dour resistance, were all but annihilated. In the retirement which followed their final heroic resistance, Corp. Holmes of the latter battalion won the V.C. by carrying a wounded soldier over a mile under heavy fire. On the same day Maj. Yate won the Cross for leading a gallant attack by a score of survivors of the same battalion, all, including Maj. Yate, perishing. Terrible losses were likewise sustained by the 1st Battalion Gordon Highlanders and the 2nd Battalion Royal Scots, who found their retreat by road cut off by the blazing vil. of Audencourt, so that they were forced to take to the open country and carry out a series of desperate rearguard fights. Numerous deeds of heroism were also recorded among the Brit. artillery, notably the famous 'L' Battery, R.H.A., of whose personnel Capt. Reynolds and Drs. Luke and Brain all won the V.C. by getting a gun away under a storm of bullets. The extrication of the Brit. corps reflected the highest credit on the skill of Smith-Dorrien, whose intrepidity, determination, and coolness are commended in French's dispatch.

Cateau-Cambresis, tn. in the dept. of Nord, France, 14 m. S.E. of Cambrai. There are wool, cotton, sugar, and soap factories, breweries, and potteries; woollen goods are manufactured, and cattle-dealing is carried on. In the sixteenth century it was for a time held by the Eng., who, however, had to surrender to Dunlos. The treaty of C. was signed here in 1558, after the battle of Saint-Quentin. Pop. 8400.

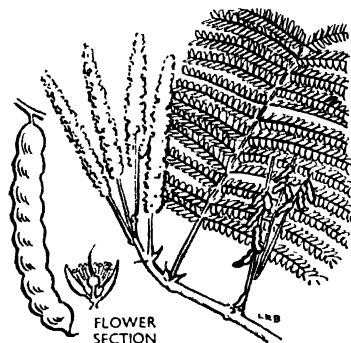
Catechism (Low Lat. *catechismus*, from *catechizare*, to catechise; from Gk. *καταγγελλω*, to catechise, instruct; all from a root word

meaning echo): 1. Religious instruction given by means of questions and answers. 2. A book of elementary instruction containing, by means of questions and answers, an exposition of religious dogma. 3. Elementary instruction, oral or written, in any branch of knowledge. In the early days of Christianity the C. was the instruction given to pagans, Jews, and others in preparation for baptism and for admittance to the number of the faithful. He who received the instruction was called the catechumen, and he who gave it the catechist. The catechumens occupied a special place in the basilica, either under the portico or in the anterior gallery. They were not allowed to remain for the sacrament, this being a mystery into which they were initiated only after baptism. During the first centuries the preparation was long, taking at first three years, then two; later everything was changed, and infant baptism was instituted, the instruction being given afterwards and, as it were, a repetition of the baptism taking place under the name of confirmation. There remains no formula of C. used by the Church of antiquity; the C. was then a real and prolonged education in morals and dogma. The earliest Christian Cs. are those of Kero, a monk of St. Gall in the eighth century, and of Otfrid, a monk of Weissenburg in the ninth. It was from the time of the Reformation that the little books called Cs. spread and multiplied. This was due to a renaissance of religious proselytism springing from the emulation between Catholics and Protestants. The Catholic Church found it necessary to define and formulate its faith, and for this purpose it issued in 1566 the *Summa Doctrinarum* of Peter Canisius, in opposition to the Protestant Cs. of Luther. A little later came that of the Council of Trent, laying down a uniform plan of instruction, and giving a model to the curés, who were enjoined to teach it at least on Sundays and feast days. This was a period of great enthusiasm, provoked by the spread of Protestantism, for the C.; priests were instructed to make the teaching as attractive as possible to the children, by the use of gentle and maternal language, the offering of little rewards, and so on. Later came other Cs., among the Catholics those of Bellarmine in 1603, of Bossuet in 1687, and the *Schema de Parro* in 1870; among the Protestants, the *Genera Catechism* of Calvin in 1536, the *Catechism of Heidelberg* in 1563, the *Zurich Catechism*, and in 1549 the C. which, with additions by Bishop Overall in James I.'s reign, forms the Eng. Protestant C. of the present day. The Scottish Presbyterians have Craig's C. (1592) and that of the Westminster Assembly of Divines (1648) now in use. The Jewish Cs. include *The Thirteen Articles of Belief* (twelfth century) of Mahmonides, Rabbi Levi's *Book of Education*, and those of Leser and Piscotto in use at the present day.

Catechol, see PYROCATECHIN.

Catechu, or Cutch (*cak*, tree, *chu*, juice; Malay *kachu*), extract obtained from sev. plants, especially from the wood of

Acacia catechu and *Acacia suma*, natives of India. This kind is known as 'black C.', and is used in tanning and dyeing. The best quality, called 'Pegu C.', is obtained in blocks covered by large leaves. The 'pale C. of pharmacy,' or 'gambir' (*terra japonica*) of commerce is a similar extract produced from the leaves of *Uncaria gambir* and *U. acida*, plants of the E. Indian Archipelago. It is sold in dry cubes about 1 in. square, and is used medicinally as an astringent, and also largely in tanning and dyeing, yielding a variety of drabs, browns, and olives. It is often used for colouring stout canvas. Its main



CATECHU

ingredients are catechuic acid or catechin, and a peculiar variety of tannic acid. 'Areca C.' is obtained from the fruits of the areca or betel palm.

Catechumen, see under CATECHISM.

Categorical, term in logic. Aristotle used it in its merely literal signification of that which is affirmative as opposed to the negative. In later logic it denoted a proposition which is asserted absolutely in contradistinction to one that is hypothetical or involves a condition. It still has this connotation, but the distinction between C. and hypothetical judgments is considered in modern logic to be one of substance or content, and not one that is merely dependent on the grammatical form of the words used. See A. Wolff, *Essentials of Logic*, 1926; B. Bosanquet, *Logic*, 1931; W. V. Quine, *A System of Logic*, 1934.

Categorical Imperative, name by which Kant in his system of ethics designates the fundamental principles of all moral laws. He held that the will or reason was guided in any given direction by an *a priori* cognition of what we ought and what we ought not to do in a particular set of circumstances; and that we were free to obey or disobey, morality being neither empirical nor a question of self-interest. This unconditional rule of duty which is valid because innate, Kant calls the C. I., and contrasts it with a command, the validity of which is dependent on some presupposed end; e.g. self-interest.

Schopenhauer attacked the theorem of the C. I. by saying that Kant confused reason with virtue and that in reality he made all actions depend upon self-interest.

Category (Lat. *categoria*, Gk. *κατηγορία*, accusation, assertion), term in logic and philosophy applied to certain general classes under which objects of knowledge can be arranged. The name was first used by Aristotle for the classification of all kinds of predicates. His Cs. are ten in number: substance, quantity, quality, relation, place, time, situation, possession, action, and suffering. This arrangement was disputed by the Stoic philosophers, and various alterations and reconstructions have been made since. The other great use of the term is the Kantian. Kant applied the term to the conceptions which the mind forms to raise the matter of knowledge received from the senses into an intelligible notion. His Cs. are (1) Quantity, including unity, plurality, totality; (2) quality, including reality, negation, limitation; (3) reality, including substance, causality, reciprocity; (4) modality, including possibility, existence, necessity. These Cs. only deal with the *a priori* conceptions of the understanding, and later philosophers have extended the use of the term to cover any necessary conception under which reality may be thought, and have given them an objective instead of only a subjective significance. Hegel was the completer of this work, begun by Fichte, and he divides all Cs. into three great classes—being, essence, and concrete thought—each subject to much subdivision. J. S. Mill classifies all describable things as (1) feelings or states of consciousness; (2) the minds which experience these feelings; (3) the external objects supposed to excite sensations; (4) the successions and co-existences, likenesses and unlikenesses between feelings or states of consciousness.

Catena (properly Vincenzo di Biagio) (c. 1470–1531), It. painter, a disciple of Giovanni Bellini. He worked chiefly on portraits and religious and historical subjects, his prin. works being 'Knight Kneeling before the Madonna' (National Gallery); 'Madonna between St. Francis and St. Jerome' (Venice), and 'Count Raymond Fugger' (Berlin). There are many examples of his work at Venice—in the Doge's palace and in the churches and the academy.

Catenary (Lat. *catena*, a chain), name given to the curve in which a cord or chain of uniform material and sectional area hangs when loaded with its own weight alone. The Cartesian equation of the curve is $y = a \cosh \frac{x}{a}$. The uni-

formly distributed rope curve is called the common C. to distinguish it from other curves which are formed when the distribution is otherwise. Thus when the loading of any portion is proportional to the horizontal projection of that portion the curve formed is the parabola, as in the case of the chains of a suspension bridge. The properties of the common

C. are interesting and various. The chief are: (1) If a horizontal line be drawn at a distance below the lowest point of the string having a weight equivalent to the tension at the lowest point, then the tension at any point in the string or chain is equal to the weight of a portion equal to the distance of the point above the horizontal line. The latter line is called the directrix of the C. (2) The radius of curvature at any point is equal to the portion of the normal intercepted between the curve and the directrix. (3) Of all curves the given length, drawn between two fixed points in a horizontal line, the common C. is that which has its centre of gravity furthest from the line joining the points. (4) The horizontal component of the tension at all points in the string is constant. (5) The area bounded by the vertical line through the vertex and the vertical line through the other extremity of any arc is equal to the length of arc multiplied by the height of the other extremity above the directrix. If the string or chain vary in diameter, so that the area of section at any point is proportional to the tension at that point, the curve in which the string hangs is called the C. of uniform strength.

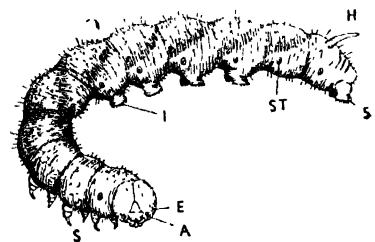
Catenipora, name given by Lamarck to a genus of fossil corals called *Hatysites* by Fischer. These concatenates are known as chain-corals, and occur only in the Ordovician and Silurian.

Cateran (Gaelic and Irish *ceathnach*, a soldier), originally an Irish or a highland irregular soldier, a kern; now usually meaning a highland freebooter or reaver.

Caterham, urb. dist. in the Wimbledon div. of Surrey, England, 7 m. S.E. of Croydon, and 20 m. S. of London. The Metropolitan dist. lunatic asylum is here, and the guards' barracks. Pop. 20,000.

Caterpillar, name given to the larvæ of the Lepidoptera, or butterflies and moths. It is a worm-like animal which consists of a head and thirteen segments, the first three being thoracic and the last ten abdominal. On the first three segments there are six true legs, each of which is jointed; and the abdominal segments often bear a varying number of tubular *pro-legs*, each ending in a circle of small hooks, the last two being claspers. These larvæ are curiously dissimilar to the perfect insect in that they possess large mandibles, while their maxillæ and labial palps are small. The spinneret, or the organ by which the silk is exuded, opens on the middle of the labium, and sometimes projects as a spine. The sense of sight is very rudimentary for, though half a dozen pairs of simple eyes (ocelli) are present on the sides of the head, they are probably merely sensitive to the difference between darkness and light. The other senses also are but feebly developed, since this larval stage is essentially a feeding period in the life-history of the insect, and every effort is made in the direction of storing up food ready for the resting stage. As might be expected in this voracious creature, the stomach is extremely large, and it is also very simple in structure. The

skin often contains odoriferous and other glands; it is very thin, and a slight wound will cause it to break and exude so much blood that the larva soon dies. The sexual organs are rudimentary and cannot be seen externally, but that they do exist has been fully proved, and in a few cases the sexes are said to differ in colour. The C. is frequently a brightly coloured creature, more especially when its unpleasing taste gives it no cause to fear birds or other enemies, but at other times it is colourless, or takes on the hue of the plant on which it lives. It may be smooth or covered with hairs. Mimicry prevails very greatly among the



CATERPILLAR

A, small antenna; E, simple eyes; H, 'horn'; ST, stigmæ; S, segments; 1, first pro-leg; 5, fifth pro-leg.

various species, and the appearance of some, which resemble twigs, is most remarkable in its perfection. A serious enemy to the larvæ is the ichneumon fly, which has the unfeeling habit of depositing its eggs in the soft bodies of the feeding lepidoptera; as the eggs hatch the resulting larvæ use up the reserve material in the bodies of their host, so that when the resting-stage comes the creature has no stored up food and consequently dies. A C. should be distinguished from a maggot, which is the limbless larva of a fly, and a grub, which is a larva having three pairs of jointed legs, but no pro-legs.

Catesby, Mark (c. 1679-1749), Eng. naturalist, b. in London. From 1710 to 1719 he travelled in N. America and gathered together a remarkable collection of plants. From 1722 to 1726 he was again in Carolina. On his return he pub. *Natural History of Carolina, Florida, and the Bahama Islands, Hortus Brianno-Americanus*, and a work on the fishes, reptiles, and insects of the is. of Providence (1731-43).

Catesby, Robert (1573-1605), Englishman, b. at Lapworth, Warwickshire, of good fortune and family. In 1604 he joined a group of conspirators, including Thomas Winter and Guy Fawkes, and was the moving spirit in the Gunpowder Plot (Nov. 5, 1605). On the discovery of the plot he attempted to escape, but was shot at Holbeach in Staffordshire.

Catfish, name given to any member of the sub-order Siluroidea, the species of which are characterised by having a naked

or bony skin without scales, a small maxillary bone, and the presence of barbels about the mouth. They inhabit all temperate and tropical regions, and only rarely enter salt water. Over 1000 species are known to exist, and those vary greatly in nature and habit; among them may be mentioned *Malapterurus electricus*, the C. of the Nile which gives an electric shock, *Silurus planis*, the wels of Ger. riva, which weighs 300 to 400 lb., *Ictalurus ponderosus*, the white channel-cat of the Mississippi, which is one of the largest fresh-water fishes, and the genera *Callichthys*, *Doras*, *Oxydoras*, and *Rhinodoras*, which travel overland in dry seasons for new ponds. *Amiurus nebulosus*, the common C. of N. America, has now been introduced to sev. places on the European continent. Species of the S. Amer. *Corydoras* are often to be seen in tropical aquaria. The term C. is also applied to the genus *Anarrhichas*, marine in habitat and not closely related to the above. *A. lupus* is common on the Brit. coasts; in spite of its forbidding appearance, it provides excellent food.

Catgut, name given to the cord made from the intestines of the sheep, ox, horse, mule, and ass—never from those of the cat. It is supposed that the proper word was *kitgut*, *kit* meaning a small fiddle, and that it has become confused with the word *kit* used for cat. C. is made into strings for harps, violins, and other musical instruments, for bow-strings, whipcord, for hanging weights of clocks, suturing wounds, and for belts for driving lathes. The intestines are thoroughly cleaned, scraped, rendered aseptic, and drawn through a perforated brass thimble.

Cathari, or **Cathars**, or **Cathartists**, widespread heresy extending among the Gnostics of the Middle Ages, gave rise to this name, which signifies 'the pure ones' (Gk. καθαροί), 'connoting cleansing, purification.' The C. assumed different names in different countries. In the E. they were called Bogomils or Paulicians; in the W. they were called Paterini, because they held their meetings where the rag-pickers used to meet, in the street Pateria. The heresy first started in the tenth and lasted till the middle of the fourteenth century, when it became rooted out by the Inquisition. Some curious tenets are ascribed to the C. They were divided into two classes, the 'Perfecti,' and the 'Credentes,' or 'Believers.' The Perfecti were saints on earth to whom the Believers gave unquestioning obedience, and whom they even adored. They believed that Satan was the ruler of this world, which was a kind of purgatory or hell, but they believed in the ultimate salvation of all mankind; man might have to return to this world more than once before his reconciliation with Christ was complete. Some even held the doctrine of metempsychosis.

Catharists, see ALBIGENSES.

Cathartic, medicine used to produce evacuation of the bowels. The term is often used to describe a purgative moderate in its action, more forcible than

a laxative, but more gentle than a drastic purgative. The action usually is to cause an increased flow of secretion from the lining of the alimentary canal and so aid in the removal of irritating matter.

Catharometer, instrument used for ascertaining the rate of flow, or any change in the composition of a gas at a given point. An electrically heated wire is put into the gas and the changes in its resistance consequent on cooling are indicated. The instrument can also be used for measurements on liquids.

Cathay, name by which China was commonly known in Europe during the Middle Ages, introduced by Marco Polo and derived from Khitai or Khitan, the earliest Mongolian tribe known to have conquered China who disappeared early in the twelfth century. The Russians still call China 'Kital.'

Cathcart: 1. Par. and tn. in Renfrewshire and Lanarkshire, Scotland, near the White Cart Water, and 3 m. S. of Glasgow, of which it is a suburb. Industries, paper-making and dyeing. Pop. of par. 47,000. 2. Dist. and tn. in S. Africa, in the S.E. prov. of Cape Colony, 109 m. N.W. of E. London by rail. Pop. of tn. 850 whites.

Cathcart, Charles Murray, second Earl (1783-1859), Eng. soldier. Son of Sir Wm. Schaw C. Joined the Life Guards in 1800. Served as lieutenant-colonel at Salamanca and Vittoria. Took part in battle of Waterloo (1815), and received the C.B. Of a scientific disposition, he discovered the mineral greenockite. Sent to Canada in 1846 as commander-in-chief.

Cathcart, Sir George (1794-1854), third son of the first Earl C., likewise a brilliant soldier, and took part in the European campaigns. Was aide-de-camp to the duke of Wellington, and served at Quatre Bras and Waterloo. Was present with his father at the Congress of Vienna (1814). Appointed commander of King's Dragoon Guards in 1838 and sent to Canada to quell the insurrection. In 1852 was made governor of the Cape and brought the Kafir war to a speedy termination. Made K.C.B. in 1853. Killed at Inkerman. Wrote *Commentaries on the War in Russia and Germany* (1850).

Cathcart, Sir William Schaw, first Earl (1755-1843), Eng. soldier and diplomatist. Son of Charles, ninth baron C. He first studied the law, then entered the army, and took part in the Amer. campaign. Made lieutenant-colonel of Coldstream Guards (1781), and commander-in-chief in Ireland (1802). Took part in attack on Copenhagen (1807). Was present at Congress of Vienna, and created earl in 1814.

Cathedral (Lat. *cathedra*), a seat or throne, prin. church of a diocese, that in which the archbishop's or bishop's throne is placed. In the primitive churches the throne was placed in the apse, behind the altar, in such a position that the bishop faced the officiating priest; its position is now usually on the S. side of the choir. Originally C. had a civil as well as a religious function, political assemblies being held in them under the

presidency of the bishop. Until the end of the twelfth century they were of no extraordinary dimensions—many of the abbey churches were much bigger. But at this period, kings and ecclesiastics co-operating, magnificent buildings sprang up, and in the thirteenth century grand ceremonies took place in and about them, when amid the pealing of bells the bishop and chapter went forth to receive the king at the entrance to the town. The administration of the C. and of the diocese is carried on by the chapter. For a description of various celebrated Cs., see under ARCHITECTURE.

Cathelineau, Jacques (1759-93), linen-merchant of scanty means, who headed the Vendéans in their opposition to the Fr. revolution—called by the peasants the Saint of Anjou, on account of his great piety. Seized the castle of Gallais, together with a cannon (nicknamed the Missionary), and offered a stout resistance to the revolutionary insurgents. Very successful at first, seizing Fontenay and Saumur. C. was then created general of the forces. Made an attempt in 1793 to capture Nantes, and succeeded; was mortally wounded; his troops at once dispersed.

Cather, Willa Sibert (1876-1947), Amer. authoress, b. at Winchester, Virginia, daughter of Charles F. Cather. When about eight years old she was taken to a Nebraska ranch. She graduated from Nebraska Univ. in 1895, and became Eng. mistress in Alleghany High School. On *Pittsburgh Daily Leader*, 1897-1901; associate editor, and eventually managing editor, *McClure's Magazine*, 1906-12. She did not marry. Her best novels are of the pioneering life in the W., and as she acknowledged herself a follower of Henry James, her work is notable for its form and style, which owe something, too, to Turgenyev and Flaubert. *Death Comes for the Archbishop* (1927), which depicts with sympathy and insight the facts of a priest's life in New Mexico a century ago, is probably her finest novel. *Shadows on the Rock* (1931) is a very good story of eighteenth-century Quebec. She also pub. a number of short stories, and in 1936 a vol. of essays entitled *Not under Forty*. Other works: *April Twilights* (verse, 1903); *The Troll Garden* (1905); *Alexander's Bridge* (1912); *O Pioneers* (1913); *The Song of the Lark* (1915); *The Bohemian Girl* (1917); *My Antonia* (1918); *Youth and the Bright Medusa* (1920); *One of Ours*, Pulitzer prize novel (1922); *A Lost Lady* (1923); *The Professor's House* (1925); *My Mortal Enemy* (1926); *Lucy Gayheart* (1935); *Sapphira and the Slave Girl* (1940).

Catherine, St. I. St. C. virgin and martyr, whose festival falls on Nov. 25. Little known about this saint; always depicted in art with her wheel and crowned. Various legends exist, amongst which may be cited the translation of her body by angels after her martyrdom to Mt. Sinai. Her prayer before her death, that the world might be converted, was granted, for when Constantine defeated Numantius, the world became Christian.

2. St. C. de Ricci, of noble parentage,

b. in Florence in 1522. Entered the convent of Dominicans at Prato, and d. in 1589. Pope Benedict XIV. canonised her, 1746, and her calendar date is Feb. 13. 3. St. C. of Bologna, b. in 1412. Belonged to a noble family. Joined the order of Poor Clares at the age of eleven, and in later years was appointed prioress of the convent of Poor Clares at Bologna. Had a beatific vision of the Virgin and Infant Son. 4. St. C. of Genoa, b. of noble parents in 1447. Canonised by Clement XII. in 1737. Unhappily married, consequently separated. Devoted her life to nursing the lepers and the sick and poor. 5. St. C. of Siena, b. in 1347. Her father was a dyer by trade. Subject to ecstatic visions from her earliest childhood, she belonged to the order of St. Dominic, and her father confessor, Father Raimondo of Capua, wrote a detailed account of her life and visions. This saint was evidently subject to cataleptic fits, brought on through her unnatural and terrible mortifications, but she was rewarded for her holy zeal with most glorious visions. On one occasion she declared that she saw Our Lord seated in glory in the midst of His disciples. On another occasion she received the stigmata or supernatural impression on her hands and feet of the scars and wounds inflicted upon the Saviour on the Cross. Although an illiterate girl, she exercised great religious and political influence, for she was instrumental in bringing the pope back to Rome, and she succeeded in reconciling Florence to the holy see. During her short life here on earth she was at times subject to the most terrible temptations, but Christ appeared to her and comforted her. She d. at the age of thirty-one. 6. St. C. of Sweden, daughter of Prince of Nierck and St. Bridget. Placed in a nunnery of Risborg when seven. Became abbess of Vatzen and d. in 1381.

Catherine I. (1680-1727), wife of Peter the Great, was of obscure birth. Her first husband, a Swedish dragon, was slain and she herself was taken prisoner at Marienburg. She became the mistress of Baurer, and then of Menshikov, but the tsar fell in love with her, and in 1723 she was crowned empress of Russia. On his death in 1725 she continued to reign alone through her favourite, Menshikov. Energy, good sense, and a lively interest in science and art characterised her rule. The 'Verkhovny Tainy Soyvet,' or supreme privy council, was instituted in her reign.

Catherine II. (1729-96), empress of Russia, was the daughter of the prince of Anhalt-Zerbst, the governor of Stettin and a Prussian field marshal. In 1745, after having adopted the name of Catherine Alexeevna, and renounced her membership of the Lutheran, in order to join the Gk. Church, she was allowed to marry Peter, the nephew of the reigning Empress Elizabeth, and the prospective heir to the throne. Her husband had all the pettinesses of a small Ger. prince, and was besides disfigured with small-pox, addicted to loathsome habits, and actuated

by a mean type of military enthusiasm, which has been aptly described as corporal's mania. For a few months Peter reigned as Peter III., but in 1762 he was murdered, probably at the instigation of his wife, and C. came to the throne. Though it is a disputed point, it is probable that her son, Paul, who bore a strong resemblance to Peter III., was really her son by her husband. She was a harsh mother to him, and whilst she lived, denied him every vestige of authority. As a ruler C. showed herself to be possessed of indomitable energy, an iron will, and great ambitions for territorial expansion. But her determination to advance her various paramours to

C. who was a disciple of Voltaire, prided herself on being guided by 'circumstances, conjectures, and conjunctions,' and not by any rigid system. This probably accounts for the irresolution and instability which marred much of her work, as also for her passion to begin enterprises which she had not the perseverance to complete: in her own words, she was a splendid *commenceuse*. During her reign the internal administration of Russia was good probably because, when her ardour slackened, there were officials willing to carry out her plans. Of her foreign policy it may be said that she was always influenced by her desire to build up a great and flourishing kingdom—a patriotic desire which won her the loyal admiration of all her people and the respect of many rival powers. But sometimes her aims were extravagant, as for instance when she entertained the idea of overthrowing Brit. supremacy in India, or of reviving, under Russian suzerainty, the Gk. empire at Constantinople. As a woman she was flagrantly and frankly immoral; her lovers, of whom the first was Count Soltikov and the last Platon Zubov (with whom she lived when she was sixty-seven), succeeded one another without intermission, and occupied almost a definite post to which a huge salary was attached. Her admiration of Voltaire led her to despise religious sects, but though her irreligion induced her to favour toleration, she refused permission to build dissenting chapels. To her *entourage* she was both kind and generous, and in her household she insisted on conformance to all the outward decencies. She had a passion for writing very poor stuff, and loved the flattery which Voltaire and her encyclopedists freely lavished on her. Her innate conservatism was shown in her bitter hostility towards the Fr. revolution, as also her unwillingness to proceed to the emancipation of the serfs. See life by Katherine Antony, 1926.

Catherine de' Medici (1519-89), daughter of Lorenzo de' Medici, and wife of Henry II. of France. She was an orphan, and married, in her fourteenth year, the second son of Francis I. For many years she lived childless and obscure, her whole policy as dauphiness being to gain and keep the favour of Diane de Poitiers and the duchesse d'Estampes, the mistresses respectively of her husband and father-in-law. She observed much, however, and gained a keen insight into the intriguing statecraft of the period. During the reigns of her husband and her son, Francis II., her life was little less passive, though she artfully managed to help the schemes of the Huguenots—not out of any sympathy for them, but to play them off against the Guises (uncles of Mary Stuart, wife of Francis II.), whom she hated and feared while appearing to support them. Her one aim was to control the power of the Guises and make her family supreme. On becoming regent at the accession of her second son, Charles IX., she entered upon a course of preposterous cruelty and corruption. Craftily she played with England and Spain, and the Huguenots,



CATHERINE II. OF RUSSIA

Engraving of a print by Caroline Watson after a picture by Rosselin

high offices, regardless of their capabilities, played havoc with her army organisation, her generals being often quite incompetent, and detracts from every estimate of her as a statesman rather than a scheming politician. Thus in 1763 she triumphantly placed her former lover and favourite, Stanislaus Poniatowski, on the Polish throne, and would always insist, despite every evidence to the contrary, that Potemkin, who enjoys the unenviable reputation of being the most notable of her many admirers, was superior to Suvarov in strategic genius. The most conspicuous of her services to her country was her consolidation of the empire and the enlargement of its frontiers. For she insisted on her full share of the spoil after each of the three iniquitous partitions of Poland (the first in 1772), and successfully manoeuvred the acquisition of Courland, nor did she come out of the war with Turkey, which ended with the peace of Kainardji in 1774, or the subsequent war with Sweden, which terminated in 1790, without substantial additions to her sphere of influence. As empress,

using them unscrupulously to serve her own purposes, stirring up the discord and hatred which culminated in the massacre of St. Bartholomew's Day. She *d.* discouraged and in despair a short time before the assassination of her youngest son, Henry III., leaving the country in a state of anarchy and confusion. C. had all the Medici love for art, and she found time to take an active part in planning the Tuileries, in enriching the Bibliothèque Nationale, etc.

Catherine Hall, identical with St. Catherine's College, Cambridge. The college was opened on St. Catherine's Day, 1473. Its founder was Dr. Robert Woodlark, who had been chancellor of the univ. in 1459 and 1462. The subjects laid down for study were such as tended 'to the exaltation of the Christian faith, the defence and furtherance of Holy Church, the growth of the sciences and faculties of philosophy and sacred theology.' Law, which was becoming a very lucrative profession, was rigorously excluded, as public feeling was strongly against its being combined with the priesthood. The statutes do not specify any other subjects of study, but other instruction, law not excluded, is now given.

Catherine of Aragon (1485-1536), daughter of Ferdinand, king of Spain, and of Isabella of Castile; wife of Henry VIII. of England, and mother of Mary I. C. had first been married to Prince Arthur, eldest son of Henry VII., but was left a widow after five months. Her father refused to pay the rest of her large dowry unless the king would consent to her marriage with Prince Henry. Henry VII. obtained a special dispensation from the pope sanctioning the union. On his accession Henry VIII. had his marriage publicly ratified. After twenty years there was no son, and this, together with the king's affection for Anne Boleyn, made him seek a divorce. After repeated promises of a dispensation from the pope, Henry first married Anne and then convened an eccles. court in London to try the question; the court pronounced his marriage with C. null. C., who had been a faithful wife and good mother, retired with the title of Dowager Princess of Wales. *See* life by G. Mallingly, 1942.

Catherine of Braganza (1638-1705), daughter of King John IV. of Portugal, and wife of Charles II. of Great Britain. C. brought Charles an enormous dowry, together with Bombay and the fortress of Tangier in Africa, but the marriage was exceedingly unpopular in England. It was also very unhappy, for Charles treated his wife with contempt and indifference, and heaped insult upon her. He, however, took her part twice against his infamous court. After a miserable life as 'a stranger in a strange land,' she returned to Portugal in 1693.

Catherine of France, or Valois, daughter of Charles VI. of France (1401-38), married Henry V. of England, as arranged by the treaty of Troyes, 1420. Their son was Henry VI. (1422-61). Henry VII. and the Tudor house were descended from her and her second husband, Owen Tudor.

Catherine Parr, sixth and last wife of Henry VIII., daughter of Sir Thomas Parr. She was a learned woman, well versed in literature and theology, and a zealous Protestant, which made her obnoxious to the Papal party, and also irritated her husband, for she tried to persuade him into completing the work of the Reformation. She was regent during Henry's expedition to France in 1544. After the death of Henry she contracted a marriage—of affection on her part and of interest on his—with Sir Thomas Seymour, lord-admiral of England, who neglected and ill-treated her. She pub. two vols. of devotional writings.

Catheter, instrument used in surgery for the purpose of allowing the passage of fluids through tubes in the body which for some cause have ceased to allow passage naturally. Thus, it is introduced into the urinary bladder of persons unable to pass their urine or into the Eustachian tube when it is stopped up by catarrh. It is a hollow tube made either of silver (by reason of its cleanliness) or of a more flexible material, such as gum elastic or vulcanised rubber. The urinary C. in the male is about 10 in. long and curved into a requisite shape, which in the case of the flexible materials can be produced by warming and bending. In the female the tube is shorter (being only 5 in.) and straighter. The introduction of the instrument must be carefully performed. The Eustachian C., which is generally of silver, is curved slightly at one end and about 7 in. in length.

Cathetometer, instrument for the accurate measure of small differences of height or of level between two near points. It consists of an upright graduated rod, carefully levelled in a vertical position, upon which a horizontal telescope slides up and down. The rod is provided with a vertical scale which indicates the difference of level between the two points under observation and the difference of height between the two objects in the distance traversed by the telescope on the vertical bar. As constructed for the physicist, with numerous additional arrangements to ensure accuracy, such as cross-wires and the micrometer eyepiece of the telescope, the C. records with a high degree of accuracy. One of the most usual uses is to test the difference between the levels of the mercury in the tube and in the cistern of a barometer.

Cathode, or **Kathode**, negative pole of an electric cell, the conductor by which an electric current leaves an electrolyte, and passes over to the negative; the opposite of the anode, which is the positive conductor. *See* under ANODE and ELECTROLYSIS.

Cathode Rays, streams of very swiftly moving particles emitted normally from the surface of the cathode in a vacuum discharge tube. The particles have been demonstrated to possess negative charges and considerable momentum and are known as electrons. A beam of C. R. is deflected by a magnetic field precisely as an electric current would be, i.e. it

moves in a direction at right angles to the beam and to the field. See also RADIO-ACTIVITY.

Catholic Apostolic Church, designation of a body of Christians who are better known under the name of Irvingites, given to them on account of their connection with the Rev. Edward Irving. Irving, when a minister of the Scottish Church, Regent's Park, London, turned in the direction of mysticism. He insisted that the miraculous gifts of the early church were to be continued throughout the new dispensation. Just at the time there came reports of miraculous gifts of healing and of tongues, and his congregation received them as authentic. In 1832, Irving was deposed from the ministry, and formed a congregation which later took to itself the title of C. A. C. This sect does not differ in any of its dogmas from the Church Catholic, but its superadded complicated ministerial arrangements. After Irving's deposition, at meetings held for prayer, certain persons claiming prophetic gifts marked out six others as 'called to be apostles of the Lord.' In 1835 six others were designated in the same manner to complete the number of twelve. These apostles are invested with the special spiritual powers of the apostles; they alone can ordain. To them is committed the discipline of the Church Universal, and the care of the mysteries of God. They alone have the power of interpreting the sayings of the prophets. The apostles then proceeded to ordain others to the ministries of prophets, evangelists, and pastors, and also to choose seven deacons to look after temporal affairs. The duty of the prophets consists in exhorting to holiness, interpreting Scripture, opening prophecies, and explaining symbols. The chief work of the evangelist is missionary endeavour, and the pastor has the charge of individual congregations. The original plan was to form a central governing body of forty-eight apostles to control the Church Universal, but this has never been carried out. The last of the original twelve *d.* on Feb. 3, 1901. The liturgies of the C.A.C. are liturgically excellent, being based on those of the Anglican, E. Orthodox, and Rom. Churches. There is an abundance of ceremonial, an extreme use of symbolism being one of the main features of the cult. In the Brit. Isles the number of adherents of the C. A. C. is 15,000. The church possesses a fine Gothic building in Gordon Square, London, W.C. See G. Miller, *History and Doctrines of Irvingism*, 1878.

Catholic Church (Gk. καθολικός, universal), name adopted in the second century by the Christian Church, to indicate the whole body of believers. It arose in special distinction from the Jewish Church, which was intended for one nation alone, whereas Christianity was for the whole earth. As heresies arose, the great test of the truth came to rest in the unanimity which the various churches founded by the apostles showed where the apostolical traditions had been handed down. Hence the C. C. was the term used to denote the body

of orthodox Christians, in opposition to local sectaries. This notion of orthodoxy acquired prominence in the E. where the Holy Orthodox Church maintains the anct. faith. In the W., the growth of the papacy as the centre of church gov. led to the word Catholic meaning 'in communion with Rome.' When the Reformation came, the Reformers did not all repudiate the term Catholic, and the Eng. Church retained the word in her creeds. But by common consent the word Catholic continued to be applied to the Rom. Church, and this usage generally continues, more especially on the Continent.

Catholic Creditor, in Scots law, where a creditor's debt is charged on sev. different parts of his debtor's property, he is called a C. C. A C. C. may realise simultaneously all his securities if necessary for fully satisfying his debt. But he is bound to allocate his catholic (Gk. καθολικός, universal) debt proportionally against all the secondary creditors affected by it, and not in such a way as to prefer one creditor to another. If he takes full payment out of one security to the exclusion of the other securities, he must assign the other securities to the secondary creditors.

Catholic Emancipation, the freedom from civil disabilities which was granted to Rom. Catholics in the United Kingdom and Ireland at the end of the eighteenth century and beginning of the nineteenth. After the Reformation, Rom. Catholics in both kingdoms suffered under many disabilities and were harassed by numerous penal restrictions and regulations. The saying of mass in England was made felony for a foreigner and high treason for a native. Rom. Catholics were not allowed to purchase land, and persons educated in the Rom. faith were incapable of inheriting property. In Ireland, Rom. Catholics so holding land could be dispossessed without ceremony by the nearest Protestant relative. Rom. Catholics were not allowed to undertake the guardianship even of Rom. Catholic children. In 1780 a Bill by Sir George Saville was introduced to repeal the most oppressive of these regulations in the case of those Rom. Catholics who would submit to a certain test. This test required the denial of various doctrines subversive of the State, such as: that no faith is to be kept with heretics; that princes excommunicated may be deposed or put to death, and that the pope has any temporal jurisdiction in England. The Bill was passed, but the effort to include Scotland under it led to such outbursts of fanaticism that the project had to be dropped. The Gordon Riots in England occurred at the same time out of sympathy. In 1791 another Bill was passed still further alleviating the Rom. Catholic burden, and in 1793 this Act was made to comprehend Scotland. Meanwhile the agitation among Irish Romanists to secure similar concessions was by no means successful, though here the laws were strictest. Attempts had been made in 1780 and the discontent finally broke

out in the rebellion of 1798. In 1824 a Rom. Catholic Association was formed under the influence of O'Connell, stimulated by the fact that many of the reforms which had been promised in order to bring about the Union in 1801 had not been carried out. In 1829, the duke of Wellington reluctantly came to the conclusion that the peace of the empire would be imperilled if the numerous disabilities were not removed, and the Catholic Emancipation Bill was carried, followed in the same year by the Catholic Relief Bill. This gave Rom. Catholics the right to sit in the Houses of Parliament, and gave them admission to most civil offices. At the present time no Rom. Catholic may be sovereign, regent, lord chancellor, lord keeper, of Great Britain, or lord high commissioner to the Church of Scotland.

Catholic Epistles, name given to seven epistles among the canonical books of the N.T. which are addressed to the Church Universal and not to the Christians at particular times. Of the seven epistles, those bearing the names of James, Jude, Peter (2), and John (3), only John 1, and Peter 1. were at first generally received as canonical. The title Catholic distinguishes this group of epistles from those bearing the name of Paul.

Catholics, Old (Ger. Altkatholiken), name assumed by certain Ger. Catholics who, in Aug. 1870, headed by Dr. Dollinger and Prof. Friedrich of Munich, protested against the dogma of the personal infallibility of the pope. An Old Catholic congress was held in 1871 at Munich, and it was resolved to unite as closely as possible with the Jansenists of the Netherlands—the Church of Utrecht. A second congress was held at Cologne in 1872, at which Prof. Friedrich declared the Old Catholics' hostility to the whole papal system. The first Old Catholic synod met at Bonn in 1874, and abolished auricular confession and compulsory fasting and recommended sev. drastic reforms. Later congresses permitted priests to marry. The movement has not increased of late years.

Catholic Truth Society, estab. in Great Britain for the spread of an intelligent comprehension of the Rom. Catholic faith. It was founded in 1872 by Dr. Vaughan, but was revised and enlarged in 1884. Its work is both educational and propagandist. It provides and circulates among Rom. Catholics books of devotion and works of instruction on the faith with polemical works enabling them to defend their position. It also publishes books for Protestants, explaining and defending the faith and practice of the Rom. Church. It also endeavours generally to promote the sale of cheap Catholic books of any kind. All its works are popular, and issued at low prices. The society is non-political, and has the cordial approval and support of eccles. authorities. The head offices are at 38 Eccleston Square, London, S.W.

Catholic University of America. In 1862 the bishops of the U.S.A. desired to found a univ. under Rom. Catholic

auspices, 'in which all branches of literature and science, both sacred and profane, should be taught.' Twenty years later Miss Mary Gwendoline Caldwell of Newport, R.I., gave \$300,000 for this purpose. Pope Leo III. formally approved and the Middleton estate, Washington, was purchased. The School of Sacred Sciences was opened in Caldwell Hall in 1889, and six years later McMahon Hall of Philosophy, Science and Letters, the gift of the Rev. James McMahon. The schools of law formed a separate body between 1896 and 1903. The univ. has full powers to confer degrees, and is under the gov. of the bishops, who have plenary authority in all that pertains to discipline, courses of study, and methods of instruction. It requires all students to take physical training, encourages debating societies, and produces many religious and literary publications. A teachers' college for instructing members of the teaching sisterhoods was approved by Pope Pius X. in 1912, and in 1914 was incorporated as a separate institution, the Catholic Sisters' College.

Catholic University Question (Ireland). The demand by Irish Rom. Catholics for the estab. of a Rom. Catholic univ. began even before the time of Disraeli. Parliament was for years consistently opposed to the proposals for any Rom. Catholic endowment, Disraeli basing his personal opposition to the estab. of a univ. on the support given by the Irish Catholic members to the disendowment of the Protestant Church of Ireland. From 1873 there existed the univ. of Dublin and the Royal Univ., but those institutions failed to satisfy the demands of the Rom. Catholics, who alleged that Dublin Univ. remained practically a private college, and the Royal Univ. no more than preparatory colleges for Dublin. A royal commission was appointed in 1901 to inquire into the C. U. Q. The report of the commission, which had not a single Irish Catholic layman upon it, stated that the Rom. Catholic pop. of Ireland, which was in an overwhelming majority, was without any adequately endowed univ., and pointed out that, apart from any question of denominations, the matter could only be settled definitely by formulating a scheme satisfactory to the Rom. Catholics. The commission recommended the endowment and equipment of a new college in Dublin on the scale required by a univ. college of the first rank, that college to be for Catholics. Notwithstanding these recommendations the C. U. Q. remained in abeyance for two years, when, in 1905, the matter was fully discussed in the debate on the civil services and revenue estimates. Finally, in 1908, the Irish Univ. Act was passed, which provided for the substitution of two new univs. at Dublin and Belfast for the Royal Univ. and Queen's College, Trinity College being left outside the Act altogether. The two new univs. were made self-governing bodies, free from all religious tests as a condition of holding any position in any foundation under the Act.

Catholikos: 1. The title of the head of the Armenian Church. 2. In the later Rom. empire the title was given to the receiver-general, or deputy receiver, in a civil diocese. In its general sense it seems to have been applied to the superintendent-general of missions or of churches on and beyond the borders of the Rom. empire.

Catiline, Lucius Sergius, member of a noble family in Rome who has become famous through the writings of Cicero and Sallust rather than by his own deserving. Born about 109 B.C., he took a prominent part in the civil conflicts in Rome, serving under Sulla. He had high intellectual qualities, great strength of body and mind, courage, civil and military capacity; but with all this he combined a moral depravity which made him disgracefully prominent even in that depraved age. His nature was brutal and savage, and this he stimulated by lustful and bloodthirsty revels on attaining a victory. In 67 B.C. he obtained the office of prætor, and went to govern the prov. of Africa. Here he laid plans for overthrowing the empire, and worked treacherously to gain his ends during Pompey's absence in Asia with the army. Returning from Africa in 66 B.C., he attempted to seize the consulship by open violence. He failed, but tried again and again by conspiracy and force to win it for himself, but he was constantly foiled by Cicero. He fell, still fighting against the forces of the gov., in 62 B.C.

Catillus, fossil genus of molluscs allied to *Crenulata* and *Perna*, received its name from Brongniart. In the chalk occur species of large size, remarkable for their largely fibrous texture, from which circumstance Sowerby called them *Inoceramus*.

Cat Island, see **BAHAMAS**.

Catkin, or Amentum, botanical term applied to an inflorescence which is a crowded, often greenish, more or less pendulous spike bearing male or female flowers. In the oak, hazel, and sweet chestnut there are male catkins, and both male and female in the willow, poplar, and birch.

Catmint, or Catnip, name applied to sev. plants on account of the fondness which cats exhibit for their odour. The term is particularly applied to *Nepeta Cataria*, a species of Labiate which is related to the ground-ivy; the flowers are white, spotted with pink, and are arrayed closely together. Other species of *Nepeta*, such as *N. cærulea*, which bears blue flowers, are called C., while *Anisomeles malabarica* and *Calamintha officinalis*, both belonging to the Labiateæ, receive the names of Malabar C. and medicinal catmint or C. respectively.

Cato, Dionysius, reputed author of *Dionysii Catonis Disticha de Moribus ad Filium*, a book of moral injunctions and precepts which was very popular in the Middle Ages. It was trans. into many languages, and Caxton printed a version at Westminster in 1483. Each apophthegm is enclosed in a couplet of dactylic hexameters. The tone of the book may

be described as monotheistic rather than Christian. There is an amusing reference to it in Chaucer's *Nonne's Tale*. Nothing at all is known of the writer.

Cato, Marcus Porcius (98-48 B.C.), known as Cato the younger, surnamed *Uticensis* (from the place of his death, Rom. statesman. After serving as a military tribune in Macedonia, he gladly renounced fighting for a prov. appointment in Asia, where he learnt so to appreciate the merits of the general, Lucullus, that he gladly supported his claims to a triumph against the vain-glorious ambitions of Pompey. Though he was no politician, Cæsar found it worth his while to dispatch C. on the unpopular mission of subduing Ptolemy in Cyprus, 58 B.C. For C. had unflinchingly opposed, first, his five years' command in Gaul, then his candidature for the consulate in 59, and finally his agrarian laws for rewarding his veterans. C.'s prætorship in 54 was characterised by his sturdy effort to suppress bribery. In 49 he had already decided to retire from public life, when the civil war broke out, and he determined to crush the tyrant Cæsar. Having persuaded the senate to give the supreme command to Pompey, he crossed with the latter to Dyrrhachium, where he remained when his general marched to defeat at Pharsalia. With a remnant of troops, C. crossed the Libyan desert, and shut himself up in Utica until he learnt of Scipio's fall at Thapsus, when he stabbed himself rather than surrender to Cæsar. Addison's tragedy of *Cato* gives a vivid picture of the heroic end of this uncompromising Stoic; his last hour was spent in reading Plato's dialogue on the soul's immortality. Posterity has perhaps magnified his fame because he was the last of the old order of Roms. to die for a national ideal which he could not realise was an anachronism. Nothing gives greater insight into his character than a remark of Cicero's to the effect that he acted as if he were in the republic of Plato instead of in the dregs of that of Romulus.

Cato, Marcus Porcius Censorius (234-149 B.C.), 'the Censor,' Rom. statesman. He was brought up, like his plebeian forefathers, as a farmer, but in consequence of the patronage of L. Valerius Flaccus he became successively quaestor, ædile, prætor (193), and consul at Rome (195) with Flaccus. As a soldier he distinguished himself for his valour and for his extreme severity both during the Punic war and his command of Sardinia. Both in the final defeat of Hannibal at Zama (202) and in the battle of Thermopylæ (191), whereby the Gks. were rescued from the aggressions of the E. conqueror, Antiochus III., he played a conspicuous part, whilst his cruel subjection of the Celtiberians in Spain (194) earned him a triumph. In his projects of reform and in his enmities he showed a like passion and sincerity. It seems certain that he was largely responsible for the prosecution of Scipio Africanus for corruption—during the Carthaginian war he had often reproached the famous general for

his luxury—and his incessant cry of 'Delenda est Carthago' shows how much the prosperity of the rival city had aroused his hatred. His reforms were largely in the shape of sumptuary laws, designed to check the growing extravagance of dress, and banquets. These were carried out during his celebrated censorship, when he also thoroughly revised the senatorial and equestrian lists so as to keep out upstarts and foreigners. Both Cicero and Livy are fond of citing C. as the model of a Rom. citizen in the republican days. His personal integrity and rugged simplicity, his stern sense of duty and rigid discipline, his frank hostility towards the new Hellenic culture, and his narrow patriotism became proverbial. In his contemptuous dismissal of Carneades and the other Gk. philosophers, and in his jealous championship of the family, he showed his extreme conservatism. His *De Re Rustica*, a treatise on agriculture, has literary merits and an historic interest, which cause the reader to regret that his *magnum opus*, entitled *Origines*, which was a comprehensive hist. of Rome, should have been lost.

Catoire, George Lvovitch (1861-1926), Russian composer, b. in Moscow. His early work attracted Tchaikovsky's attention and showed his influence, but gradually, C. evolved an individual style, fine and elaborate, especially in his pianoforte quartet and later songs. His pianoforte concerto (E flat) was performed at Queen's Hall, London, in 1920. Became prof. of composition at Moscow Conservatoire. Works include: *Mazpi*, a symphonic poem after Lermontov, many songs and choruses, and two violin sonatas.

Catoptries, that part of the science of light or optics which deals with the laws of reflection. See REFLECTION, LIGHT.

Catorce, tn. of Mexico, in the state of San Luis Potosí, 120 m. N. of the tn. of that name. It is noted as a silver and tin mining centre, and has numerous smelting works. Pop. 20,700.

Catostomus, genus of fishes of the family Cyprinidae, which are peculiar to the rivs. of N. America. They are distinguished from their ally, the carp, by having their lips thick and pendent, no barbels, a long dorsal and a short anal fin.

Cato Street Conspiracy, plot formed in London in 1820 to murder Lord Castle-reagh and the rest of the ministers at a dinner at Lord Harrowby's on Feb. 23, to set fire to London, to seize the Bank and the Mansion House, and proclaim a provisional gov. The plot was revealed to the police by one of the conspirators named Edwards, and the ringleaders were arrested. Thistlewood, the chief, Ings, Brunt, Tidd, and Davidson were hanged, and five others transported for life. The plot was so called from the place of meeting in Cato Street, Edgware Road.

Catrail, known as the *Plot's Work*; the name given to an earthwork, consisting of a ditch with a rampart on either side with a breadth of from 20 to 26 ft. and 50 m. in length, which extends from

near Galashiels, through Selkirk and Roxburgh, to Peel Fell in the Cheviots. For an account of the various theories about the C., see *Blackwood's Magazine*, 1888.

Catrine, tn. in Ayrshire, Scotland, 2½ m. E.S.E. of Mauchline. It manufs. cotton. Pop. 3000.

Cats, Jakob (1577-1660), Dutch poet and humorist, studied law at Leyden, and later won renown as an advocate for his defence of a witch. Part of his life was spent on a farm at Grijskerke in Zeeland. Driven from his farm by the collapse of the dykes, he was for some time stipendiary magistrate at Middelburg and Dort, whilst in 1636 he became grand pensionary of Holland, and twelve years later keeper of the great seal. A knight-hood was one result of his embassy to Charles I. of England in 1627. The somewhat archaic character of his style and subjects has deterred many a student from reading his poems. He was by creed an Orangeman and a Calvinist, and enjoyed for many years a great vogue. His *Houwelijk* (1625), and the *Trouwlingh* (1637), a collection of tales about curious marriages, as well as his *Spiegel van den ouden en nieuwen Tijd* (1632) well represent the purity of his morals and diction, his homely wit and power of shrewd observation. His *Complete Works* in 19 vols., were issued in 1790-1800. See also Piggott, *Moral Emblems, with Aphorisms, etc., from Jacob Cats*, 1860.

Cat's-eye, stone so called from its likeness to a cat's eye. It is another variety of chrysoberyl, and is found in Ceylon, China, Brazil, and Malabar. The stone, when cut only but not polished, if the structural arrangement is perfect, produces a narrow and distinct line of light which much resembles that emanating from the interior of the eye of a cat. The colour of the stone varies; it is grey, brown, and black, with yellowish or greenish tints, or sometimes it is the palest apple-green or a deep olive colour. The line of light when held in front of the eye should cross the centre of the dome and be narrow and well defined. The chatoyant line is usually white. The hardness of the C. is 8.5, and the sp. gr. 3.5 to 3.8. The lustre is brilliant with iridescent ray—the cleavage is imperfect, the fracture conchoidal. It is, moreover, doubly refractive. It is soluble with borax or salts of phosphorus, but untouched by acids. There are three varieties of C. Quartz C. is softer, 7 instead of 8.5, and it is less lustrous than the C. belonging to the chrysoberyl variety. There is also Crocidolite C. or tiger's-eye, which is cut and artificially coloured. It is a much softer stone and of a silky lustre.

Catskill Mountains, large range of well-wooded mts. belonging to the Appalachian system of N. America; they are situated chiefly in Greene Co. and form one of the most beautiful situations in America. Their sides are very steep, and they attain to a height of nearly 4000 ft. in some places. The chief peaks are Round Top Peak and Overlook Peak.

An hotel, erected on the last-named peak, stands at an elevation of 3800 ft. The vill. of C. lies in the state of New York, and is 34 m. distant from Albany. It is the cap. of Greene Co., and is hilly, with irregular roads.

Cat's-tail Grass, or **Timothy Grass**, popular name of *Phleum pratense*, a species of Gramineæ which flourishes in all temperate countries but Australia, and affords good fodder. The inflorescence has free glumes and two distinct paleæ.

Catt, Carrie Chapman (1859-1947), Amer. suffragist, b. at Ripon, Wisconsin, U.S.A. After being educated at Iowa State College and taking a special course in law, she became superintendent of schools in Mason City, Iowa. She organised the Iowa Woman Suffrage Association in 1890, and then transferred her activities to the National Amer. Woman Suffrage Alliance. She served as president of that body 1900-04, and was again elected in 1915. Later, she became the leader in the campaign to submit a woman suffrage amendment to the Federal Constitution. This was adopted by Congress in 1919 and ratified by the necessary number of states in 1920. This gave the franchise to every female in the U.S.A. after she attained her twenty-first year. Mrs. C. was chosen president of the International Woman Suffrage Alliance 1904-23. In 1930 she won a \$5000 *Victoria Review* award for 'outstanding achievement' and another award in 1933 for bringing about a better understanding between Jews and Christians. In 1935 the Turkish Gov. issued a postage stamp bearing her portrait in honour of her position as head of the International Woman Suffrage Alliance. Awarded medal of the National Institute of Social Science, 1940.

Cattaro or Kotor: 1. Fortified Yugoslavian seaport in Dalmatia, at the head of the gulf of C., 40 m. S.E. of Ragusa, lying between the Montenegrin mts. and the Adriatic. The tn., besides being a strongly fortified military station, has a cathedral and a naval school, and gives its name to a sea in both Rome and Gk. Churches. One time the cap. of a small independent state, C. in 1420 joined the Venetian republic, but was ceded to Austria in 1814 by the treaty of Vienna. Twice the tn. has been almost destroyed by earthquake, in 1503 and 1667. During the First World War C. was the base of the Austrian submarines; it was occupied by the Ita. in Nov. 1918, and in 1919 was given to Yugoslavia. Pop. 5000. 2. The gulf of C., a wide inlet of the Adriatic, length 20 m., and depth 15 to 20 fathoms, consists of three basins connected by narrow straits.

Cattegat, arm of the North Sea, some 150 m. in length, joining the Skagerrak on the N. and the Baltic on the S., and bounded E. and W. by Sweden and Jutland respectively. Its sandbanks endanger navigation.

Cattermole, George (1800-68), Eng. painter, b. near Diss in Norfolk. He became an associate of the Water-Colour Society in 1822; received a first-class gold

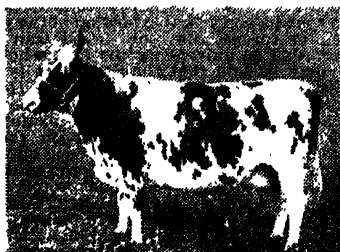
medal at the Paris Exhibition in 1855; studied oil painting in later years; illustrated the Waverley Novels and other books.

Catterick, vill. in the N. Riding of Yorkshire, England, 4 m. S.E. of Richmond. Near it is a large camp of the Brit. Army. There is also a race-course. Pop. 700.

Catti, or **Chatti**, anct. Ger. people who lived in a dist. round the higher reaches of the Weser, etc., corresponding roughly to the modern Hesse. In the first two centuries A.D. they frequently fought against Rome and were finally incorporated with the Franks in Clovis's kingdom.

Cattle. The influence of Brit. breeds of C. has been felt in all parts of the world, which in itself is evidence of their value. The Shorthorn is the most cosmopolitan breed, and the most commonly distributed in these is. In most parts of the world, except its place of origin, the Shorthorn is called the Durham breed—a more suitable term because Shorthorn applies to a number of other breeds. There are many other breeds, each having valuable characteristics developed from the unimproved condition in which they were found subsequently to the first great improvement wrought in the Longhorn breed by Bakewell in the latter half of the eighteenth century. There is little use in discussing breeds previously to this period, for, on the whole, the origin of Brit. breeds from the earliest periods is still a subject of debate. Gradually, in accordance with soil and climate, local breeds—some widely spread—had estab. themselves, and where the locality, dist., or area was very similar over a sufficiently extensive country, animals acquired indigenous features and characteristics which stamped them as breeds recognisable by certain peculiarities. There were, however, many parts of the country where the soil was so diversified that no special type was found. In dists. where the soil varies frequently, and consistency in breed is met with in only small areas, outside breeds have to be adopted, whether for meat production, milk producing, or both. The Shorthorn, in particular, adapts itself to such areas, and it is found in all parts of the country. These dists. are also much associated with the breeding of cross-breeds.

C. are kept with two main objects, production of beef and of milk, or both, and a very common div. of the breeds is made in accordance with these. In this connection, the term improved C. may be explained. Unimproved C., as a rule, fatten, and mature slowly, and yield a moderate supply of milk. The object of the breed maker or breed improver is to select animals which conduce to one or both of these purposes. To a great extent these two purposes are antagonistic, and where the objective is the development of beef, with its necessary accompaniment of early maturity, the milking properties are usually deteriorated; whilst it is only the exceptional animal which combines high milking



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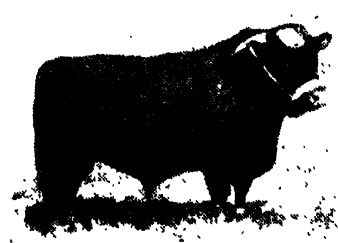
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'Farmer and Stockbreeder'

1-4, DAIRY CATTLE; 5-6, DUAL-PURPOSE; 7-8, BEEF (not to scale).

- 1, Ayrshire, in calf
- 3, Jersey.
- 5, Shorthorn
- 7, Hereford heifer

- 2, British Friesian bull
- 4, Guernsey.
- 6, Red Poll.
- 8, Devon bull.

properties with good meat-making qualities. The fusing of these two properties, especially in the Shorthorn, has met with success. It may be noted here that some continental breeds have superior milking properties to the generality of Brit. breeds. Brit. breeds have always shown an aptitude to produce meat, and whilst the pop. of these is. was comparatively small, and beef rather than milk was needed, Brit. breeders were right in paying more attention to beef. But the increase in pop. and in milk consumption has turned the modern farmer towards increasing the milking properties. Few would include in the div. of breeds more than the Shorthorn (either Coates or the Lincoln Red) and the Red Polls as dual-purpose breeds; though, despite their small size, Dexters are equally entitled to the claim. The animals of heavy build, emphasising the features of meat-producers, are the Hereford, Aberdeen Angus, Devon, Sussex, Longhorns, Welsh C., Galloways, and W. Highlanders. The light breeds yielding exceptional quantities of milk in ratio to their weight are the Jerseys, Guernseys, Ayrshires, Brit. Friesians, and Kerries. Among minor breeds with little influence outside the dist. to which they are indigenous are Zetland or Shetland C.

Pure breeds are in relatively small proportions to cross-breeds, or the animals of which the pedigree cannot be traced, though classed as belonging to the breeds to which they approximate. Animals, however, may be pure bred although the pedigree may not have been kept, provided the dam is the offspring of five generations of dams sired by a pedigreed bull. A pedigree is valuable when it records skilled mating and selection over a long period, but if it records the results of unskilled mating it may be harmful; for if bad features are perpetuated for a long series of generations, they become estab. to the prejudice of the offspring. It has been said that the Shorthorn is the most cosmopolitan breed. This results from the sev. breeds, including some of continental source, which went to form the Durham breed, subsequently known as the Shorthorn. As a grazing beast the Shorthorn is seen at its best on rich pastures. It is really a very highly bred animal, and, if pasturage is very good is sure to do well; but it is not the best breed on many poor pastures. It is difficult to draw hard and fast conclusions, because experience affords conflicting evidence; but except on the richest pastures, the Shorthorn is not so well adapted to very heavy land as are the native breeds of middle horns. This is illustrated by the Sussex breed in Sussex, the Devon in Devon, the Hereford in Hereford and on the Red Sandstone generally. Climatic conditions also have their influence, and the short-coated Shorthorn does not thrive so well under the same exposure as the long-coated W. Highlander. Nor is the Shorthorn generally so well suited to the high and wet hills as local breeds which have become acclimatised. It is evident,

therefore, that where the animals have to spend a considerable portion of the year on pasturage, no one breed can be regarded as universally the best; though it may be said that the Shorthorn is the best over the greatest area. The Hereford, the Welsh, the Sussex, and the W. Highlanders may be taken as examples of breeds which thrive well on rough grazing in winter time, even outside their indigenous dists. But the grazing value of a breed does not altogether settle its commercial value for the farmer: the yarding capabilities have to be taken into consideration, more especially where the grazing season is short and the yarding season is long, as in the bigger arable dists., where winter grazing is almost impossible, and where C. must feed on swedes or mangold and hay. Here the Shorthorn makes its special value felt, as does the Polled Angus, another splendid beef. The Hereford, Devon, Sussex, Galloway, Red Poll, and Welsh (both the N. and S. Wales or Anglesey and Castle Martins) yard well. The grazing cos. are the rearing homes of the greatest number of calves, though, of course, dairying dists. are the chief breeding grounds. At the same time large numbers of calves are taken from their mothers very soon after birth, and are sent long distances to be weaned. The calves from the great milking dists. of the vale of Aylesbury, Somerset, Cumberland, and other places are in great demand among raisers of heifers in other parts because of the good type of cow kept there. Farmers raising their own stock are as a rule very careful in their breeding; but the methods of the dairyman and small-holder, as a rule, have not always been above criticism. There is no economy, and, indeed, great harm may lie, in using other than well-bred bulls. The application of artificial insemination to C. breeding has been taken up in recent years in many countries. By this means the services of the best pedigree bulls are available for breeders, resulting in calves being superior to their dams, and herds developing into first-class C. The artificial insemination centres of the Brit. Milk Marketing Board provide inseminations for both beef and milk breeds.

The cow carries her young nine months, and it is regarded as being best to arrange the date of her first calving about May, so that by gaining about two months in each year the calving will work back into the winter months by the time she is in full profit. A cow is regarded as at full profit at her third calf, and if she is bred from regularly, the next four calves go further back, so that the period when she gives her fullest yield will be at the time of year when milk is most valuable. Ordinarily the lighter-framed milking breeds, which have little value comparatively when fat, are bred from when youngest, many stock-raisers thinking that from two years to two and a quarter years is best; but some keepers of heavier breeds think three years best. Where animals are bred from when young it is necessary to keep them better than

when they are older and have less growth to make. Helpers need to be strong when they breed, and should not be allowed to get into poor condition. Some cows dry off very early, and have a long off-lying period, during the first part of which they may be kept on moderate diet, but cows which milk but a short period (except through some special cause, such as illness, prematurely stopping the milk flow) are rarely worth keeping on. On the other hand, some of the very highest-bred beef-making cows, valuable for that very purpose, often milk but a short time. As the time for calving approaches the udder and teats enlarge and become firm. The appearance of the water bladder indicates immediate calving. After calving, a thin bran mash, or water containing a little oatmeal, should be given, though when greatly distressed gruel well fortified by whisky or beer should be administered. The cow-keeper's great fear is that his cows may abort or present their calves when immature. This often takes a contagious form, causing severe loss over years, and when this occurs those who are not acquainted with the necessary treatment should at once consult a veterinary surgeon. When the weather is at all fair, it is well to let the cow calve in the open, as on grass the calf is less liable to contract diseases through contact with germs, which may accumulate about buildings where cows frequently calve, and which often attack through the navel of newly born calves. To guard further against germ attack, the calf should be placed at once on a clean sheet, and the navel be dressed with antiseptic, such as carbolic oil, dilute lysol, etc. The calf should be allowed to suckle the cow as soon as it can stand, and weakly calves should have the milk squirted or spooned into the mouth, for it rapidly invigorates them. The first milk, called colostrum or beistings, is a special provision of nature suited to the digestion of the infant calf, and is very rich; and certainly calves which have the colostrum are less liable to constipation than those fed on milk from staler cows. The cow will instinctively lick a newly born calf whilst it is in a slimy condition, and it is well it should, as it acts as a form of massage, stimulating the vitality of the calf, and is generally accepted as being beneficial to the cow. Cows sometimes become very excited on first seeing the calf, and maternal solicitude and pleasure may be shown in the unpleasant form of tossing or kneeling on it, to which the calf quickly succumbs. It is therefore well to be acquainted with the hist. of the animal. Until more recent years there was great loss of cows which 'dropped' after calving; i.e. had milk fever or parturient apoplexy. Injections of iodine of potassium into the teats inaugurated successful treatment by injection, but other substances such as lysol have been successfully used, and now ordinary atmospheric air or pure oxygen gas is found to be efficacious, with or without a drug. Cows sometimes

'drop' from other causes than parturient apoplexy, and simple remedies and attention will get them on their legs again. Amateurs who practise the injection method should be fully impressed with the need thoroughly to disinfect everything associated with the process. When calves are brought up by suckling their mothers, rearing is comparatively simple. It is expected of a cow that she will maintain her calf and give a considerable quantity of milk besides; in fact it is a poor milker which will not rear two at once. Many farmers make a cow rear five during the course of a milking period: two during the first three months, two during the next three, and one subsequently. A calf at three months can be maintained without milk, as by that time it gets a good digestion, and with fresh grass and a little additional food, such as finely broken linseed cake, will do well, though if skim or separated milk is available it will be greatly to the advantage of the calf. If there is no separated milk given, linseed-cake meal and linseed should form the chief basis of the gruel, and a little sago is useful to prevent scour. Many calf-rearers make a mistake in giving hay too early; it is best withheld until the sixth week; but, under the impression that because hay is dry it will stop scour, some rearers give it freely, with the result that the digestion is overtaxed. Calves at first should be fed at least three times a day, and cleanliness must be observed in every way. Though rather more costly than simple mixtures made on the farm, unless the feeder can be relied upon to make his mixtures properly, some of the calf foods sold as proprietary articles are safer, and it is wiser to use them in such cases. A large number of calves die from being too generously fed when they have been unduly fasted; this often occurs when freshly calved calves are exposed in markets, or are sent long journeys to be reared. In such cases, allowing them as much milk as they will take is a form of killing by kindness. Scour is always the dread of the calf-rearer, whether it comes from chill, injudicious feeding, over-exercise, fright, or from contagion. A good scour mixture should always be at hand, and nothing is better than one composed as follows: Compound tincture of morphia and chloroform, 4 dr.; liquid bismuth, 4 dr.; oil of cloves, 1 dr.; cooled linseed tea, 7 oz.; the dose being a tablespoonful every eight hours.

The treatment of the calf after weaning, and when it is independent of the cow and hand-feeding, may differ considerably, according to the object in view. The practice of allowing the calf to suckle until it is a year old, as is done with some of the highly bred animals intended for show purposes, is not possible with ordinary stock to be sold as beef; though those animals which are brought to considerable weights at a year or a few months older necessarily require to be fed at high pressure from birth to butcher. Winter calves do well at grass during the early summer, and in mild climates,

where there is no fear of the husk worm, they may remain out until October, but in cooler dists., where the land is wet and liable to husk, it is found advisable to take them in by mid Aug. or Sept., or as soon as fogs keep the grass wet. Many rearers prefer to keep the calves in throughout summer, but provided there is shelter from sun there is no objection to even young calves being out in June and July. When calves from six months upwards come into the yards they naturally receive winter fare of hay, roots, and finely ground cake; though if they receive chaffed hay or oat straw, a small quantity of meal can be given to encourage their eating it. In the second year's grazing it is not necessary to give any extra food during summer, though it is not unprofitable to give a small quantity of cake, especially if it is desired to get the stock out early. In some dists. young stock receiving a little cake on grass, with a small quantity of hay in severe weather, if provided with shelter against wet or bad weather, will thrive well up to Jan. In other dists. young stock is rarely seen on the grass after the early part of Oct. In the second winter, when run as stores, the animals often get nothing but the browsing of straw with roots, and 3 or 4 lb. of cake, and will do well on it. Some pastures will fatten out two- to three-year-old C. during summer without any help, and a pasture reaches the high-water mark of grazing if it will fatten out a big beast to the acre without aid. It is customary to put those most forward in condition on to the richest grazings, so that they will come on the market as quickly as possible; because early summer meat generally sells well, as there is often a gap between the time when the yarded beasts are finished and that when the grazed beasts are ready. The second grade of C. will be fattened out after July, and up to the time when those to be fattened in the yards in winter are taken in. The failing powers of the grass will generally occasion the need for help as the season advances. The winter feeding does not materially differ from that of the previous year, except that the animals require more, and will consume, according to size, 50 to 80 lb. of roots per day, and in some cases as much as a hundredweight is satisfactorily given. The hay allowance may run to a stone per day, and chaffed straw to about the same weight or more. The cake allowance may start at 6 lb., and be increased to 8 lb., adding as much meal. Very much higher quantities are occasionally given, but there is no compensatory equivalent in return for the outlay. It is certainly a mistake to increase the quantity of a rich cake, such as linseed, beyond 8 lb. Such increase as is made should be in the starchy or carbonaceous foods, otherwise there will be great liability to scour, which is nature's method of relieving the system from overfeeding. Linseed cake is highly nitrogenous, and if too much nitrogen gets into the blood it is poisoned through being overassimilated, so that the animal is liable to apoplexy. However,

the system generally revolts and prevents the digestion of more than is food for the beast by passing it rapidly through the intestines.

In all matters of C.-keeping the farmer has to be guided by his purpose and the nature of the food available. For this reason hard and fast rules cannot be laid down. The farmer considers whether it will pay him best to maintain his animals mainly on the raw material the farm provides, keeping them to an older age and then fattening them out, with a short period of healthy feeding, or whether he will rely largely on purchased concentrated foods. In the one case he keeps his animals as stores in good going condition; in the other he feeds them at high pressure, giving much concentrated food throughout their lives. Often the relative value of store stock and fat stock will make him alter his ordinary course. The buying of cattle at their proper value, of course, has a great effect on the profit of feeding. In some places animals are bought on their live weight, being weighed before being offered for sale; but this is by no means general. The weighbridge is an undoubted aid to the ordinary purchaser, but though he knows the weight, he still has to recognise the growing capabilities, the feeding powers, and the quality of the meat which will result. As regards indications of growth, animals that will grow well are generally long in the frame. Furthermore, the skin and hair as results of breeding and selection indicate thriving or lack of power to thrive. In the thrifty animal the skin is loose on the ribs when gripped by the fingers, readily lifting; moreover, when the lifted portion is rubbed between the tips of the thumb and finger it has a soft unctuous feel. A skin of this sort, as a rule, carries a nice soft hair, plentiful and not harsh. A good thriving animal has a big heart girth—that is, the measurement round the body behind the shoulders is big, the ribs are well sprung, and the hinder quarter from the shoulder back to the tail is full, as should be the round and buttocks—that is, the parts below the tail to the hocks. The top line and the belly line should be parallel, and from the setting on of the neck the fore part of the carcass should be well square with the hind quarter, giving the impression of a long, deep parallelogram. The fore part of the animal carries the least valuable meat, but beasts poorly developed in front rarely make good beefers. The strictly milking breeds are light in the fore quarters and full in the hind, gradually deepening from front to rear, thus providing ample room for digestion and for milk making—suggesting a wedge in shape. Looked at from behind over the back, the milking cow runs fine over the withers or shoulders, gradually widening, so as to show great width over the hips, suggesting yet another wedge shape. These two are described as giving the double wedge which a milking cow should possess.

Tuberculosis in Cattle.—Tuberculosis assumes its most serious form in the udder, the average in number affected in

England and Wales being one in five hundred; but the percentage differs in different dists., age and conditions of maintenance being important factors. Where a system of veterinary inspection is carried out, few animals are affected. In the industrial tns., statistics show that a proportion of raw milk, varying in different places from 2 to over 10 per cent, contains living tubercle bacilli. Some 5 to 6 per cent of all deaths from tuberculosis are due to the bovine type of bacillus, and some 2000 deaths, mainly of infants, in England and Wales occur annually from this cause. But in recent years there has been a steady increase in the supply of milk from tuberculin-treated herds.

Scientific Methods of finding Feeding Standards.—Different methods have been employed by investigators in order to determine the maintenance requirements of C. The Ger., Thaer, about a century ago, evolved a feeding standard by the simple process of feeding an animal on hay, weighing it at intervals, and so arriving at its rate of growth. The hay ration was then partly replaced by some other feeding stuff and the amount of the substituted ingredient increased or decreased until the original rate of growth was again obtained. In this way, Thaer was able to measure the hay equivalents of many feeding stuffs, and then to state, empirically, the hay ration necessary to keep up a normal rate of growth. These standards were useful in their day, but when, later, chemical analysis was applied generally to the investigation of feeding stuffs, it was seen that what animals required was not a certain quantum of food per head a day, but such an amount as would ensure a certain rate of protein, carbohydrate, and fat. Rations stated in these terms were proposed by Grouven in 1859, and five years later, Wolff, the leading Ger. authority on feeding stuffs for animals, prepared a series of standard rations in terms of digestible protein, carbohydrate, and fat for different animals under different conditions. These standards, annually revised, were pub. in the Ger. Agric. Calendar until 1906, and were then modified by Lehmann, and these modified standards gave place ten years later to the Kellner standards. Kellner, by the balance method of investigating metabolism, determined that the maintenance ration of a 1000-lb. steer should provide 6 lb. of starch equivalent, which should comprise a minimum of between 0.5 and 0.7 lb. of digestible protein. Previously Lawes and Gilbert, at Rothamsted, had used the comparative slaughter method for determining the relation between the consumption of fodder and the amount of vendible flesh produced, and the sources of fat in the animal body. This method definitely estab. that the chief source of fat in the body is the carbohydrate in the feeding stuff; and, further, that a fattening animal retains only about 5 per cent of the protein consumed, while a young growing beast may retain as much as 25 per cent for conversion into flesh. This method

is costly and involves a great deal of labour in sampling and analysing carcasses, but after some years' intermission was once again employed in Cambridge and elsewhere in the investigation of difficult problems connected with the process of winter fattening of C. Kellner devised the apparatus known as the respiration chamber for the purpose of sampling and analysing the gaseous excreta, with the view of striking a complete balance between the constituents of the fodder consumed and the total excreta of the animal. From these and other experiments, he determined that the proportions of the main food constituents required to produce 1 lb. of fat in the animal body were: protein, 4.25 lb; fat (in cereals) 1.90 lb.; carbohydrate, 4.00 lb.

Cattle Statistics.—The chief C.-raising countries are the Argentine Republic, the U.S.A., Canada, and Australia, each having a large export trade in live animals or meat or both. A general estimate of the actual number of head of C. in the various countries of the world gives the following figures: All India, 161,000,000 (oxen), plus 45,000,000 buffaloes; U.S.A., 66,000,000; Soviet Russia, 51,000,000; Brazil, 40,500,000; Argentina and Uruguay, 40,500,000; China, 22,000,000 (excluding 12,000,000 buffaloes); Germany, 20,500,000; France, 16,000,000; Australia, 14,000,000; Union of S. Africa, 11,000,000; Poland, 10,500,000; Canada, 8,000,000; England and Wales, 6,700,000; Eire, 4,000,000; Scotland, 1,310,000; and N. Ireland, 740,000. European C., however, are used chiefly for domestic consumption, and, in a less degree, for the export trade in hides and skins. Among the essentially stock-raising countries for the export trade, Argentina leads the world, as may be deduced from the fact that its production is nearly 40,000,000 C., with a pop. of 10,000,000, whereas the U.S.A., while producing 66,000,000, has a pop. over twelve times as great. More than 250,000,000 ac. in the Argentine Republic are used for C.-raising, and production has almost doubled in the present century. It increased by some 12,000,000 head since the beginning of the First World War, which of itself gave an immense impetus to its development. The number of beef C. in the Argentina decreased in the decade following the war, as also was the case in the U.S.A. and Australia; this was the natural result of increased production in the European countries. While Argentina owes its great and characteristic industry to a large extent to the introduction of C. by the Spaniards, the importation of Brit. breeds in later years has greatly fostered the industry. Over 3000 bulls, chiefly from England, were imported in the first two or three years of the present century, and bulls to the value of over \$2,000,000, chiefly from England and the U.S.A., were imported in 1907, huge prices being paid by wealthy Argentines for the best stud-bulls. Again, a large number of *estancias* are in the hands of Englishmen, and throughout the Pampas are a great many Eng. managers of estates. The favourite breed

is the Durham, and it may be remarked here that Bovril C. are Durhams, a preference due, it is said, to the C. being fed on lucerne. The next favourite breed is the Hereford, almost pure bred, which have long usurped the place of the semi-wild animals of over seventy years ago. There are also some fine specimens of Aberdeen Angus, a useful breed which is a better milker than the Hereford, stands the cold, and yields beef of a high quality. For C. in Africa, see under TSE-TSE-FLY.

See T. B. Wood, *Animal Nutrition*, 1924; J. Hammond, *Farm Animals, their Breeding, Growth, and Inheritance*, 1940; F. H. Garner, *The Cattle of Britain*, 1944; J. Anderson, *The Semen of Animals and its Use for Artificial Insemination*, 1945; E. R. Cochrane, *The Milch Cow in England*, 1946; L. Hogben, *Principles of Animal Biology*, 1946; S. J. Watson, *The Feeding of Livestock*, 1948.

Cattle Plague, see RINDERPEST.

Cattleya, genus of Orchidaceæ, the species of which grow wild in tropical America. It is noted for the large and beautiful flowers, and some of its members are cultivated in Eng. greenhouses. *C. labialata* is the best-known species in Britain.

Cattolica, tn in the prov. of Girgenti, Sicily, 14 m. N.W. of Girgenti. It has sulphur works and salt mines. Pop. 8000.

Catullus, Gaius Valerius (87-54 or 57 B.C.), Rom. lyric poet, was admitted as a youth to the best society at Rome, which at that time included Cicero, Cornelius Nepos, Clodia the poet, and Hortensius. There is much uncertainty on the dates of his birth and death. Jerome, in the *Eusebian Chronicle*, under the year 87 B.C. has 'Gaius Valerius Catullus . . . nescitur' and, under 57 B.C. 'Catullus xxx etatis anno Romæ moritur.' Some historians, keeping St. Jerome's calculation of C.'s age as 30, give the terminal dates as 84 B.C.-54 B.C. There is, however, internal evidence (the poet's allusion to the prosecution of Vatinius) that he lived to the month of Aug. 54 B.C. In 56 B.C., on his way home from Bithynia, he visited his brother's grave near Troy—an event to which he alludes in his poems. He played no part in public life, but passed his time between his villas on the lake of Como and at Tibur (Tivoli). As the reader would gather from many of his verses, which seem struck out in a white heat of party furore, he was filled with a violent dislike of Cæsar, who, nevertheless, showed the poet every courtesy. The Lesbia who inspired most of his splendid passionate love poetry is thought to have been the sister of the notorious P. Clodius Pulcher. As a poet, C., 116 of whose poems are still extant, is remarkable for his mastery of the Lat. language, which he endows with the sweetness, flexibility, and melody of Gk.; for his beautiful imitations of many Gk. metres; for his sympathetic expression of every phase of feeling, and for his consummate art. A paraphrase of Callimachus's *The Lock of Erecina*, and the weirdly imaginative *Attila*, are two of his finest elegies. His epic narrative of the mar-

riage of Peleus and Thetis contains fine descriptive passages. Among the numerous Eng. translations of C., mention should be made of those by Robinson Ellis (1871), a verse translation in the original metres, H. Macnaughton (1899), and F. A. Wright (1926). Robinson Ellis is also the author of an excellent Commentary (1876).

Catulus, Gaius Lutatius, Rom. general in the first Punic war; made consul 242 B.C. After the most inglorious period of the war for Rome (248-3 B.C.) during which Rome attempted no fresh naval operations, wealthy private citizens offered the State a new fleet of 200 ships, with which C. gained a decisive victory near the Ægation or Ægadian Is. (q.v.) on the W. coast of Sicily, which compelled the Carthaginians to abandon to the Romans their last bases, Lilybæum and Drepanum (241) and so ended the war.

Catulus, Quintus Lutatius, Rom. general, and consul with Marius, 102 B.C. The following year the united armies of C. and Marius succeeded in defeating the Cimbri, but C. was ignored. This led to resentment, and C. joined Sulla in the Civil war. He was amongst the proscribed on Marius's list, so committed suicide. He was a very cultured man, being both a poet and an orator.

Catulus, Quintus Lutatius (d. 61 B.C.), son of the preceding, shared his father's hatred of Marius. He was made consul with Marcus Aurelius Lepidus, 78 B.C. C. was of a generally quarrelsome disposition, for he had disputes with Lepidus, Pompey, and Cæsar, but he was nevertheless an ardent patriot.

Catumbella, riv. of W. Africa, rising in the N. of Benguela and entering the Atlantic 14 m. N.E. of the vil. of Benguela. The whole dist. is unhealthy, but the vil. of C., at the mouth of the riv., being less so than Benguela, is rapidly superseding it.

Caub, or Kaub, tn. in the Prussian prov. of Hesse-Nassau, on the r. b. of the Rhine, 30 m. W.N.W. of Wiesbaden by rail. It has slate quarries. Blücher crossed the Rhine near C. in Jan. 1814. Pop. 3000.

Cauca, riv. of Colombia, S. America, rising in the Andes and flowing 600 m. N. to join the Magdalena near Tacaola. Its valley is fertile, healthy, and very beautiful, and is rich in minerals and forest trees. Also the name of a dept. of Colombia with an area of 11,660 sq. m. and a pop. of 427,400. Gold is found there in moderate quantities. The chief tn. is Popayán.

Caucalis, genus of Umbelliferae, consists of herbs with multiplied leaves and white flowers, and is found in S. Africa and N. hemisphere. In Britain the species are called bur parsley or hedge-parsley. *C. (or Turilis Anthriscus)* and both *C. daucoides* and *C. latifolia* are found on chalky soils in cornfields.

Caucasus is the name of the great mt. range extending for some 550 m. from the peninsula of Taman on the Black Sea to that of Apsheron on the Caspian. The breadth at the widest is some 150 m. From the luxuriant plateau of grasses and forests to the N., the mts. rise in a suc-

cession of terraces, the parallel chains being divided by high plains cut up by narrow fissures of great depth. The S. slopes towards Georgia present magnificent scenery; towards Kur they are much steeper, and often sheer precipices. From the central ridge, where the perpetual snow-line is 10,500 ft. high, six peaks are thrown up with an elevation of over 16,000 ft. Mt. Elbruz reaches an altitude of 18,540 ft., and next to it come Koshtantau, Dikhtau, and Kazbek. Whilst the central spurs are granitic or pure granite, mica- and talc-schists and other metamorphic rocks are found about the granitic axis. In spite of the absence



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of volcanoes, there are many signs of volcanic action in past ages. To E. and W. are thermal springs. Most of the streams of the C. unite with one of the four chief rvs., the Kuban and the Rion, flowing to the Black Sea, and the Terek and the Kur, flowing to the Caspian. The Kur and Rion are S., the other two N., of the mts. Of the carnivorous animals the most important are wolves, lynxes, panthers, and jackals, whilst wild boars and the aurochs (*Bos urus*) are still found. Forests cover 56 per cent of the C. area. The flora is characterised by the plentitude of arborescent growths, the variety of aquatic plants, and the preponderance of pines. There are many ac., especially southwards, under vine cultivation. Large crops of rye and wheat in N. Caucasia, and of maize, rice, and tobacco in Transcaucasia are harvested each year. Mulberry-trees for the silk industry, melons, apricots, peaches, and nuts are grown. The output of petroleum from the wells of Baku was 8,800,000 tons in 1928-29 and over 20,000,000 in 1934-35. Aluminium, iron, lead and zinc, copper

ore, manganese, salt, and a poor quality of coal are also mined. The chief products are petroleum, silk, corn, and manganese; these reached an annual value of £10,000,000 before the First World War; no reliable figures are available for the post-war period. Through the deep fissure of Darial Gorge the Russians with great difficulty constructed a military road, which rises to 8000 ft. above sea-level. The main railway from Russia has its terminus in Vladikavkaz, whilst another line connects Baku, via Tiflis, with Poti and Batum. N. and S. of the central chain of C. are the old provs. of Ciscaucasia and Transcaucasia. Vladikavkaz and Tiflis, the chief tns. of the two provs., are connected by the military road. To-day these two regional names have given place to the following names of ters. and republics: (N. of the Caucasus) Krasnoda ter., Orjonikidzi ter., Daghestan, Autonomous S.S.R., N. Ossetian Autonomous S.S.R. and other smaller autonomous divs.: (S. of the Caucasus) the Georgian, Azerbaijan, and Armenian S.S.R.'s. In 1897 the census gave the rapidly increasing pop. of Caucasia as 9,291,000. No comparable figure can be given for the present day owing to the altered political divs. of Caucasia; but the combined pop. of Azerbaijan, Georgia, and Armenia was 8,052,000 in 1940. Ethnologically the pop. of the region consists of very various races. Though certain anthropologists employ the term Caucasian to indicate the white, as opposed to the yellow or Mongolian peoples of Caucasia, they recognise that the groups of white men are separated alike by distinctions of race and language. More than half the pop. is composed of foreigners, the chief of whom are Tatars (Kalnuks, Turkomans, etc.), Semitic peoples (Jews and Arabs), Iranians (Kurds, Persians, and Armenians), and Europeans (Gks., Gers., and Slavs). The Caucasians fall into four groups, in each of which considerably affinity prevails. They are: (1) The S. or Kartveli div., including Georgians, Imeretians, Mingrelians, Laz, and Gurians. (2) The E. div. of Tchetchens and Lezgians. (3) The Ossetians of central Caucasia, an Aryan race who call themselves Irun. (4) The W. div., comprising the Kabardians, Abkassians, and the Circassian or Cherkess race. In the Kartveli and E. stocks combined there are five times as many people as in the remaining two groups. All the languages are harsh. Many are absolutely peculiar to the region, and their origin is still a moot point. Thus some ethnologists connect the Georgians with the biblical Hittites; others see in their tongue Aryan or Turkoman affinities. As regards religion in Caucasia, the Caucasians, Tatars, and Iranians are Moslems; the Armenians are Christians of the Gregorian Church. Until the Russian revolution the Russians and Georgians were Christians of the Orthodox Gk. Church. A few belong to nonconformist denominations. Generally speaking, the Caucasians are hospitable, superstitious, and revengeful. Their respect for

property is still very small. Placed like a buffer between Europe and Asia, they have been obliged all through hist. to fight hard for their independence. This was at last broken in 1859 by the capture of the Lezghian leader and prophet, Shami. In 1870 Russia finally succeeded in establishing her rule throughout Caucasia. Yet the inhab., in spite of the Russian Govts., managed, until the Russian revolution, to retain their tribal customs and social organisation.

In Nov. 1914 the Turks intended attacking through Transcaucasia, but the Russians anticipated this and attacked them from Kars towards Erzerum. In the ensuing new year the Turks again attacked, but were again routed. In March 1915 the Turks assaulted Batum, and once more suffered defeat. In May 1915 the Russians commenced offensive operations and advanced towards Lake Van. They overcame all Turkish opposition in this area, but did not press on beyond the mts. towards Mosul. In Jan. 1916 the Russian attack was renewed against Erzerum on their right flank, which fell to them in the middle of Feb. The Grand Duke Nicholas pressed closely on the heels of the retreating Turks towards Erzincan. On the Black Sea coast the Russians had also captured Trebizond. They made another advance in the summer, again routing the Turks. The situation of the Turkish forces was now desperate: rations were scarce and morale very low; but the Russian revolution put an end to all offensive action by that nation and the Russian forces eventually withdrew in Jan. 1917, in accordance with the preliminary negotiations of the Brest-Litovsk treaty (q.v.). With the collapse of Russia Germany once more saw a prospect of attacking India through Persia and Afghanistan. To prevent this a small Brit. force under Maj.-Gen. L. C. Dunsterville set out from Bagdad for Baku in Aug. 1918. The main object of the force was to make a rallying point for the Armenians, who were naturally hostile to the Turks, and who had promised support. The Armenians were joined by many Russians in their desire to be rid of the Turkish yoke. On the arrival of the Brit. force at Baku, however, the Armenians and Russians did not fulfil expectations, and when in Sept. the Turks attacked in overwhelming numbers the Brit. force was compelled to re-embark and leave Baku to its fate, as the Baku levies would not offer any serious resistance to the enemy even in their own cause. As a result of the First World War, Caucasia became a unit of the Union of Socialist Soviet Republics, with the title of Transcaucasian Soviet Federal Socialist Republic. It contained three republics—the Azerbaijan, Armenian, and Georgian—with a central executive committee at Tiflis. They were recognised as independent states just after the war, but a Bolshevik movement in 1921 seized the executive power, and they became members of the U.S.S.R., each adopting a soviet form of gov. Azerbaijan, on its W. side, borders the Caspian Sea,

and Georgia borders the Black Sea on its E., both meeting just W. of Tiflis. Armenia lies to the S. of the S.W. portion of Azerbaijan and S.E. portion of Georgia. In 1936 each of the three republics was declared a separate Constituent Republic of the U.S.S.R. See A. F. Mummery, *My Climbs in the Alps and Caucasus*, 1895; D. W. Freshfield, *The Exploration of the Caucasus*, 1896; E. A. Martel, *Côte d'Azur russe*, 1908; F. Nansen, *Through Caucasus to the Volga*, 1931; D. Tutaeff, *The Soviet Caucasus*, 1942.

Cauchon, Pierre (d. 1443), bishop of Beauvais. Famous for the part he played in the trial of Joan of Arc. He seems to have been a member of the Burgundian faction but violated the obligations of his ministry by cruelty, besides espousing the Eng. cause. He was expelled from his see in 1429 and betook himself to the Eng. court. On the capture of Joan of Arc in his diocese, C. asserted his right to put her on trial, and, it is said, he resorted to the meanest infamies in order to secure her condemnation. Excommunicated by Calixtus IV.

Cauchy, Augustin Louis, Baron (1789-1857). Fr. mathematician, b. in Paris. Received instruction first from his father, and was afterwards educated at the *École des Ponts et Chaussées* (1807). Began his career as an engineer, but took up the study of mathematics soon afterwards, and was appointed to the chair of mathematical physics at the univ. of Turin (1831). Was loyal to the deposed king, Charles X., who made him tutor to his grandson (1833), and then created him baron. C. travelled about with his young pupil, the duke of Bordeaux, and returned in 1838, finally accepting a post at the *École Polytechnique*. He wrote many articles on mathematics and physics. C. is renowned for his memoir on wave-propagation, for which he received the Grand Prix of the Institute of 1816.

Caucus is a word whose derivation is still a moot point. About 1725 it appeared in Boston as the name of a political club. In America it is still restricted to a meeting of party managers who choose the candidates to be proposed at the forthcoming election or to select delegates for a nominating convention. In England the term is applied in a derogatory sense to such a rigorous system of party organisation as Mr. Joseph Chamberlain introduced at the foundation of the Birmingham Liberal Association in 1878, when it became almost a principle that voters must vote with their party.

Cauda-Galli Grit, term applied in N. Amer. geology to the lowest subdivision of the Devonian system. The name (literally cock's tail) is derived from a common fossil of this name, with a feathery form, and supposed to be a seaweed. See CORNIFEROUS PERIOD.

Caudata, or **Urodela**, name applied to an order of Amphibia which has for its distinguishing characteristics that the species are scaleless, have a well-developed tail which persists throughout life, and usually two pairs of limbs. There are about 100 species, and they occur all over the

temperate N. hemisphere. Newts, salamanders, and mud-eels are representative of the order.

Caudebec, name of two places in the dept. of Seine-Inférieure, France. **C.-en-Caux**, on the Seine, is famous for its fifteenth-century church; pop. 2100. **C.-les-Elbeuf** manufs. cloth; pop. 8,800.

Cauderan, com. of Gironde dept., and suburb of Bordeaux, France; has chemical and chocolate manufs. Pop. 20,000.

Caudillo, Sp. for commander, a title applied especially to Gen. Franco (*a.v.*).

Caudine Forks (*Furculæ Caudinæ*), pass in ant. Samnium, near the tn. of Caudium, formed by two narrow wooded gorges, between which lay a plain, grassy and well watered, but entirely enclosed by mts. (Liv., ix.). Here the Romans suffered a crushing defeat by the Samnites in the second Samnite war (321 B.C.).

Caudium, ant. tn. in Samnium, Italy, on the road from Beneventum to Capua, later the Appian Way. It was probably once of great importance as the cap. of the Caudini, but at the period of its first mention in hist., at the time of the Samnite wars, was very small and unimportant.

Caudry, tn., 8 m. S.E. of Cambrai in the dept. of Nord, France; has breweries and distilleries and manufs. textiles. Pop. 12,460.

Caul (from *κάλυξ*, a cap), close-fitting cap of network worn by women in the fifteenth and sixteenth centuries; hence a portion of the amnion or thin membrane covering the fœtus which sometimes remains round the head of a child after birth. Many superstitions are connected with this retention of the C. To be born with a C. (Byron was an example) was considered lucky, and still is in out-of-the-way places. It was considered a protection against drowning either to the original owner or to any future purchaser. A C. used to fetch large sums, from £10 to £30 sometimes, among seafaring men.

Caulaincourt, Armand de (1772-1827), Fr. general, who served under Napoleon. He suffered the vicissitudes of fortune in his earlier career, for he was degraded from the rank of captain in the army and had to serve as a private. He was afterwards reinstated through the intervention of Lazare Hoche. C. was accused of being instrumental in the arrest of the duc d'Enghien, but he stoutly denied it. He tried to dissuade Napoleon from embarking on the Russian war; he accompanied him to Poland, but was recalled to Paris. He took an active part in diplomatic service during Napoleon's regime, and was appointed minister of foreign affairs, but retired from service after the second restoration. See *Mémoires du général de Caulaincourt, duc de Vicence, grand écuyer de l'Empereur* (2 vols.), containing accounts of Napoleon's conversations. Paris, 1933 (Eng. translation by H. Miles, 1935).

Caulerpiæ, fossil genus of siphonous or green alga which is scattered through nearly all the marine formations. Recent species of *Caulerpa* have been found in warm S. climates and in the Mediterranean.

Caulfield, tn. in the co. of Bourke, Victoria, Australia, 6 m. S.E. of Melbourne by rail. Pop. 41,000.

Cauliflower, variety of *Brassica oleracea*, or cabbage, and is known botanically as *Botrytis cauliflora*. Like the broccoli, *B. asparagoides*, it is formed of a fleshy inflorescence modified into a flattened head of abortive flowers, and it differs from the broccoli in being whiter and less hardy. It is said to have been imported from Cyprus in the sixteenth century, but it is now naturalised in Britain, growing in a rich soil under more careful conditions than cabbage. When the head begins to show, the large surrounding leaves are drawn up and tied around it to make it of a very white appearance. There are sev. varieties of C., but they differ negligibly in quality, early dwarf Erfurt being about the best.

Caulking, in wood shipbuilding, the process of driving oakum, or untwisted rope, into the seams of the outside and deck planks of a ship, and finally coating the oakum-filled seam with tar or resin, in order to render the joints of the planking watertight.

Caulonia, vil. in Calabria, Italy, 45 m. N.E. of Reggio on or near the site of the ant. C. or Aulonina, a colony of the Achæans. The exact site is unknown and depends upon the identification of the R. Sagra, N. of which, according to Strabo and Pliny, was C.

Caulopetris, name applied to the fossil stems of some tree-ferns which bear spiral markings like those of the leaf-scars of recent species. They occur in Brit. coal formations, and *C. anglica* is a common species.

Caunt, Benjamin (c. 1815-61), Eng. pugilist of Hucknall-Torkard, Nottinghamshire, son of a tenant of Lord Byron. In 1835 he was defeated by 'Bendigo' (W. Thompson). In 1837 he attracted attention as a fighter by defeating W. Butler. His style was never very scientific, but he was resolute, powerful, and courageous; over 6 ft. in height; 14 st. 7 lb. in weight. He became champion of England in 1838, after beating Bendigo in seventy-five rounds. In 1843 he became proprietor of the Coach and Horses public-house, St. Martin's Lane, London.

Caurus, ant. city on the S. coast of Caria, in Asia Minor opposite the is. of Rhodes, to which C. belonged for a long period. It was the bp. of Protogenes, the painter, a contemporary of Apelles, and was noted for its fruit.

Cauquenes, tn. in Chile, S. America, cap. of the prov. of Maule, 75 m. N.E. of La Concepción. Wheat and vines are grown in the neighbourhood. Pop. 10,000.

Caura, riv. of Venezuela, rising in the sierras of the S. and flowing N.N.W. to the Orinoco. The ter. of C. stretches on either side (22,485 sq. m.) with large forests of tonka beans.

Caus, or **Caux**, Solomon (1576-1628), Fr. engineer, . at Dieppe; appointed mathematical tutor to the Prince of Wales in 1612. He entered the service

of the elector palatine in 1613, and laid out the gardens at Heidelberg Castle. He returned to France and became engineer and architect to the king in 1623. His books include *Institution harmonique* (1615) and *Raisons des forces mouvantes avec diverses machines* (1615), in which he describes the process of machine movement propelled by steam with so much resemblance to that of Della Porta that the invention of the steam engine has been ascribed to him by some writers.

Cause, Causation, Causality.—*In Logic.* In physical science the truths to be discovered generally relate to the connection of cause and effect, and we usually call them 'laws of causation' or 'natural laws.' By the 'cause' of an event we mean the circumstances which must have preceded in order that the event should happen. Nor is it generally possible to say that an event has one single cause and no more. There are usually many different things, conditions, or circumstances necessary to the production of an effect, and all of them must be considered causes or necessary parts of the cause.

Aristotle distinguished four kinds of causes for the existence of a thing: (1) The Material Cause, the substance or matter composing it. (2) The Formal Cause the pattern, type, or design, according to which it is shaped. (3) The Efficient Cause, the force employed in shaping it. (4) The Final Cause, the end, motive, or purpose of the work.

In Philosophy.—Causality, in systems of rationalism, is considered in the problem whether reality exists at all beyond our own thoughts. Thus Descartes held that the certainty that reality exists could be reached through the medium of causality. In the growth of empiricism, the supposed truth that every event must have a cause is held to be derived, in a sense, from experience; for it could not very well be supposed to be in the mind of any one who had not witnessed instances of causation. But critics of empiricism ask whether it be really true that every event must have a cause, in the future as well as in the past, and affirm that all that mere experience could tell us would be that certain particular events in the past have had a cause. Locke includes causation among the truths that are necessarily and universally true, i.e. truths that are due to some capacity of the mind that goes beyond the mere collection of past experiences. The Idea of Cause enters into the consideration of the belief in an identical self, another important problem in the growth of empirical philosophy. The necessity of the causal relation conditions Berkeley's advance from the mere existence of ideas to his conception of the world as a universal and rational system of signs, dependent upon God. He found, as he thought, a basis for the reality of causation, in that free activity of Spirit, which is rationally intelligible, though not picturable to the imagination. But this position still leaves unanswered the question. What is the impression from which the idea of cause is derived?

Again, if the belief in the necessity of a cause does not go back to any intuitive or demonstrative truth, it must come from observation and experience, a position which Hume considers in the form: Why do we believe that any particular cause will necessarily be followed by some particular cause? And the only reason there can be is that we have found this effect to follow in the past: 'Thus we remember to have seen that species of object we call flame, and to have felt that species of sensation we call heat. We likewise call to mind their constant conjunction in all past instances. Without any further ceremony, we call the one cause, and the other effect, and infer the existence of the one from that of the other. Thus, in advancing, we have insensibly discovered a new relation betwixt cause and effect, when we least expected it. This relation is their constant conjunction.' Kant agrees with Hume, that necessary and universal judgments go beyond experience; but Hume denies the existence of such judgments, whereas Kant affirms their existence and demonstrates, that in mathematics and physics necessary *a priori* judgments are constantly made and that therefore their possibility is satisfactorily explained. Hegel partly supports Kant's phenomenalism, agreeing that causality is a category (*q.v.*), but holds that a series of causes never goes back to an original cause, but only to an infinite regress of finite causes, none affording an ultimate explanation. See also KNOWLEDGE; SENSATION and SENSATIONALISM.

Cause Célèbre, term used to signify any lawsuit of great public interest or importance apart altogether from any question of legal principle, *e.g.* the Palmer poisoning case, the Tichborne claimant case, the Hansard libel prosecution, the Dreyfus case, the trial of Madame de Steinheil. The expression *Cs. Cs.*, according to Wharton, was the title of a series of reports collected by Gayot de Pitaval of decisions of interest in Fr. courts in the seventeenth and eighteenth centuries.

Causerie (Fr.), short, informal article or lecture on any subject of literary interest, either art, the drama, or literature itself. The name owes its origin to the *Causeries du lundi* of Sainte-Beuve, which, however, often cease to be informal and become very elaborate essays. Matthew Arnold frequently used the C. form of essay, and it has become a regular feature of many periodicals and newspapers.

Causses (Lat. *calx*, lime), name of the plateaux sloping westward from the Cévennes in the depts. of Lozère, Aveyron, Gard, and Hérault. They are of limestone formation, dry, sterile, and cut by numerous streams, the Tarn, Jonte, and Dourbie among others. Into deep canyons which divide the main plateau into four main and sev. smaller O. The chief are the C. of Sauveterre, Méjan (4200 ft. at its highest point), Noir, and Larzac. Surface pits, underground streams, and stalactite caves are a great feature of the dist. Owing to the sterility of the soil and the rigours of the climate there are

few industries; the chief is the rearing of sheep from whose milk Roquefort cheeses are made. On the S. border of the Causse Noir is 'the dolomite city,' Montpellier-le-Vieux.

Caustics: 1. In chem. are substances which have the power of corroding or burning up living tissues. This they generally do by their avidity for water, a substance which is necessary to the tissues, and so its extraction causes death. The most commonly used is silver nitrate or lunar caustic, which is employed to destroy warts, cancerous growths, poisons, etc., and leaves the surface black after operation. Caustic potash and caustic soda are the hydroxides of potassium and sodium respectively, while caustic lime is the unslaked oxide of calcium (CaO).

2. In optics, are curves or surfaces formed by the reflection or refraction of light at the surface of a reflecting or refracting medium. They are produced by spherical aberration. When a narrow pencil of rays of light is incident at the centre of a lens or mirror, all the rays are brought to one focus, but if the pencil is broad this is not the case, the rays from the periphery or margin come to a focus at a different point on the axis from those from the centre. Thus, if we take two rays arriving at points in the lens at different distances from the centre, after refraction they will cross one another before crossing the axis. At this point of intersection there will be increased illumination, and the surface formed by the intersections of the whole series of rays is a surface of increased illumination known as a caustic surface, and converging at a point on the axis known as the focus. If a section of this surface is taken through the axis in any plane it will take the form of a cuspidal curve, called a caustic curve, with its point at the focus. A similar effect is produced when a broad pencil of light meets a reflecting surface, and the curve is then more easily seen and generally observed. Thus, when light is shining on a cup of tea, the tea surface cuts in the caustic surface in a caustic curve seen as a bright curve on the tea culminating at the bright focal point at the cusp.

Cauterets, fashionable watering-place, 3250 ft. above sea level, in the beautiful valley of the Lavedan in the dept. of Hautes-Pyrénées, S.W. France. Its twenty-four thermal sulphurous springs draw many invalids. C. is popular as a centre for climbers on the Pyrenees. Pop. 1300.

Cautery, name given to an instrument or a process for heating or burning the tissues of the body. It provides counter irritation over an inflamed part, destroys diseased or dead tissue, or, in some cases where a white heat is applied, is useful for performing operations in parts which are either difficult to get at or vascular in nature. Its application near a bleeding artery is very efficient to check the flow of blood. There are various forms of C., and the heat applied in them varies according to the nature of the operation to be performed. The actual C. is an

instrument with a blade or head of steel or platinum heated in a lamp or fire before application. The thermo-C., as in the form called Paquelin's C., has a hollow head kept hot by means of a contained benzol lamp or the passage of hot vapour. Galvano-C. contains a wire or wires along which an electric current passes, so that the heat emitted can be varied by altering the strength of the current. Of late years it has been found that C. by concentrated heat rays from the sun possesses many advantages over the other and earlier methods.

Cautin, coastal prov. of S. Chile, producing wheat, cattle, lumber, tan-bark, and fruit. It is traversed by the Rio Tolten, forming its S. boundary, and the C. or Rio Imperial, which rises in the Andes and flows 180 m. westwards to the Pacific. Cap. Temuco on the Rio C. Pop. about 385,000.

Caution, or Cautionry, in Scots law, means an obligation by which one person becomes pledged as security or surety for another, either to do a certain act or pay a sum of money, or as guarantor for the good conduct or fidelity of the other. Such obligations must always be in writing, otherwise they are unenforceable. As in the Eng. law of suretyship so in the Scots law respecting a C. the *cautioner* is under no greater liability than the prin. debtor or person for whom he answers. The cautioner where sued by the third party or creditor has a right to obtain relief against the prin. debtor. Co-cautioners, bound by the same writing, are jointly bound to the creditor, and no one co-cautioner can insist on the obligation or liability being divided *pro rata* among all, though each has a right of contribution against the others afterwards. The cautioner, where bound as full debtor for the prin. debtor, or jointly and severally with the latter, may be sued for the whole debt, and no longer, in the absence of any stipulation to the contrary, has any 'benefit of discussion,' i.e. right to call upon the creditor to demand payment from the prin. debtor besides registering the debt or charge. The cautioner is exempt from any further liability where the prin. debt comes to an end or where the creditor alters the position of the prin. debtor without obtaining the cautioner's consent, as e.g. by giving him time to pay or discharging him altogether.

Cautley, Sir Proby Thomas (1802-71), Eng. soldier and engineer, b. in Suffolk. He served for some years in the Bengal artillery until he undertook the reconstruction of the Doab Canal. His great work was the construction of the Ganges Canal, a masterpiece of engineering, opened in 1854.

Cauvery, riv. of S. India, which rises in the W. Ghats of Coor., traverses the plain of Mysore, and flows through two mouths into the bay of Bengal. Its course, which is never navigable, is interrupted by twelve anicuts or dams for irrigation. The chief anicut, which crosses the Coleroon, is 2200 ft. long. Electric power for Mysore is produced from the beautiful C. Falls. Near these are the ls. of

Sivasamudram and Seringapatam, sacred to every devout Hindu. The C. waters a very fertile country of over 1,000,000 ac.

Caux (so called from the chalk soil) is the name of an old dist. corresponding to that of the modern Havre, Dieppe, and Yvetot. It is in Normandy, facing the Eng. Channel. Its people live by pasturage and agriculture.

Cava dei Tirreni, tn. and episcopal see of Campania, Italy, 6 m. N.W. of Salerno by rail. It is situated 980 ft. above sea level in a fertile and well-cultivated valley, surrounded by high hills, and is a favourite holiday resort. It has manufs. of silk, woollens, cotton, and linen. About a mile to the S.W. is the famous Benedictine abbey of La Trinità della Cava, founded by St. Aferius in 1025 and possessing valuable archives now the property of the nation. Pop. of com. 27,000.

Cavaignac, Jacques Marie Eugène Godefroi (1853-1905), Fr. politician, son of Louis Eugène C. He early declared himself an ardent republican. He served in the Franco-Prussian war in 1870; became republican deputy for Saint-Calix (Sarthe) in 1882; served as under-secretary of war (1885) and as minister of marine and of the colonies under President Loubet (1892). He was minister of war in the Brisson Cabinet, 1898, when he played a prominent part in the Dreyfus case. He discovered the document, which incriminated Dreyfus, to be a forgery, but resigned his position rather than consent to a new trial of Dreyfus, in whose guilt he was a firm believer. His book on the *Formation de la Prusse contemporaine* dealt with the events of 1806-13.

Cavaignac, Louis Eugène (1802-57), Fr. soldier and politician, b. in Paris. Entered the army as an engineer in 1824; served in Morea and afterwards in Algeria, where he won great distinction. In 1848 the provisional gov. made him governor-general of Algeria, but the troubles of the revolutionaries in Paris led to his recall as minister of war. He was appointed dictator to quell the insurgents, and drove them with great bloodshed to the barricades. In the same year he was made president of the council. He was defeated as a candidate for the presidency of the republic by Louis Napoleon and retired into the ranks of the opposition, which led to his imprisonment at the *coup d'état* of 1851. On his release he retired into private life until his death. See life by A. Deschamps, 1870.

Cavaillon, tn. on the Durance, in the dept. of Vaucluse, S.E. France. It has Rom. and medieval remains, including a cathedral, and is a commercial centre for melons and early vegetables, and for the silk and preserved fruits industries. Pop. 11,750.

Cavalcanti, Bartolommeo (1503-62), Florentine noble and orator, who led a revolt against the Medici, and was afterwards employed by Pope Paul III.

Cavalcanti, Guido (c. 1250-1300), It. poet and philosopher. His father was one of those whom Dante mentions in the *Inferno* as condemned to torture among the Epicureans and atheists, but Guido

himself was a friend of the great poet, who dedicated his *Vita Nuova* to him. By his marriage with Beatrice, daughter of Farinata Uberti, C. became head of the Ghibelline faction in Florence, and when the leaders of both Guelphs and Ghibellines were driven out by the people of Florence, he was banished to Sarzana and returned to Florence only to die. He wrote in prose on philosophy and oratory, but his most famous work is the seventy-line metaphysical *Canzone d'Amore*, beginning 'Donna mi priega.' He wrote many ballate, canzoni, and sonnets of great beauty and sweetness, but there is a tendency in many of his poems towards too great an admixture of metaphysical borrowed from Plato and Aristotle, which, while adding to the depth, spoils the sweetness. The best ed. of his works is *Erocle's Guido Cavalcanti e le sue Rime*, 1885. See also D. G. Rossetti's rendering of sev. of his poems in *The Early Italian Poets*, 1861, reprinted in 1874, and revised and rearranged in 1892 as *Dante and his Circle*.

Cavalcaselle, Giovanni Battista (1820-1897), It. author and art critic, b. at Legnano. In 1846 he went to Germany, where he met J. A. Crowe (1825-96) (q.v.) and returned to Italy with him. In 1848 he was banished for his share in the It. revolution; he accompanied Crowe to London and collaborated with him in *Early Flemish Painters* (1857). In 1858 he returned to Italy and pub. his *History of Painting in Italy* (1864-71), and the lives of Titian (1876) and Raphael (1883), in all of which he was assisted by Crowe. In 1861 he became secretary to Giovanni Morelli (1816-91), the art critic and patriot, then engaged as president of a commission appointed to bring all works of art, which could be considered public property, under gov. control. In 1878 he was appointed chief of the National Art Gallery at Rome. The great *History of Painting* was under revision by Crowe until his death in 1897, when it was continued by S. A. Strong (d. 1904) and Langton Douglas; vols. I. and II. appearing in 1903, and vol. III. in 1909.

Cavalier (Low Lat. *caballus*, poor horse), originally a horseman, horse-soldier, hence knight, gallant. In Eng. hist. the name is familiar as that applied by themselves to the adherents of the Stuarts in the contest between Charles I. and Parliament, their opponents being nicknamed Roundheads. The name survived till the extinction of the C. Parliament (Exclusion Bill, 1679), being then replaced by Tory. The connotation 'haughty' or 'supercilious,' showing a thoughtless and selfish arrogance, was not prevalent until a century later (Wylde). The variant 'chevalier' was used as a title in certain orders of knighthood and was also a name particularly applied to the Younger Pretender.

Cavalier, Jean (1679-1740), Camisard leader, b. at Ribaute, the son of a peasant. In 1702, when the persecuted Protestants of the Cévennes rebelled against Louis XIV., C. became one of their first leaders, and sev. times defeated the royal generals,

obtaining excellent terms from the marquis de Villars in 1704. He fought at Almanza in 1707, and later entered the Eng. service, where he became a general.

Cavalleri, Buonaventura (1598-1647), It. mathematician, devoted his life more especially to the study of geometry. From his youth upward he was the victim of a cruel disease, which his work helped him to forget. In his *Geometria indivisibilibus continuorum nova quadam ratione promota*, 1635, he expounded his celebrated 'theory of indivisibles,' which has been invaluable in the determination of centres of gravity and volumes, and has contributed not a little to the development of the integral calculus. He applied his method with equal success to areas and solids. According to his conception all space may be regarded as made up of an infinite number of parts, which represent the limit of decomposition which the mind can imagine anything to undergo. There are further treatises of his on trigonometry, logarithms, and conic sections.

Cavalla (Kavalla), tn. and port in a bay of the same name, in the dept. of C., Gk. Macedonia. Cap. of that dept. and centre of a tobacco-growing dist. Mehmet Ali was born here. It was Turkish ter. until the Balkan war, 1912-13. C. has been identified with Neapolis (Acts xvi.). Pop. (dept.) 120,000; (tn.), 51,000.

Cavalli, Francesco (1602-76), It. musical composer, b. at Crema, his real name being Pier Francesco Caletti-Bruni. He took the name of C. from his patron, a nobleman at Venice, where he became a singer at St. Mark's in 1617, rising eventually to be *maestro di cappella*. He wrote numerous popular operas, which are dramatic and humorous, though often exaggerated. On the occasion of the marriage of Louis XIV. in 1660 C. was invited to France to produce his opera *Serse* (*Xerxes*) and two years later he returned to produce *Ercole amante* (*Hercules as Lover*). C. therefore did something to acclimatise opera in France and his recitative won the admiration of Lully, the founder of Fr. opera.

Cavalli, Giovanni (1809-79), It. artillery, b. at Turin, and studied cannon-founding in Sweden. In 1846 he returned to Italy, and his experiments in the construction of breech-loading guns resulted in great improvements in the practicability and capability of those weapons.

Cavallini, Pietro (c. 1250-c. 1330). It. painter, was a pupil of Giotto at Rome. Like many of his contemporaries he was also a master of mosaic work, a sculptor, and an architect. His great 'Crucifixion' fresco at Assisi is still fairly well preserved, and recently some valuable paintings of his at the church of Santa Cecilia, in Rome, have come to light. It is said he helped his master in the mosaic of the Navicella at St. Peter's Church. Is believed by some to have influenced Cimabue and Giotto.

Cavallo, Tiberius (1749-1809), It. electrician, settled in England about 1771, and remained here for the rest of his life. He invented chemical apparatus and

many extremely sensitive and accurate instruments for measuring the force of electrical current. In his *Treatise on the Nature and Properties of Air* he discussed Dr. Priestley's recent discoveries, rejected the phlogiston hypothesis, and noted for the first time the nature of the influence of light and air on plant life. His *Treatise on Electricity* (1777), proved him also to have been a natural philosopher of no mean order.

Cavallotti, Felice (1842-98), It. politician, poet, and dramatist, b. at Milan. In 1860 he pub. a tract, *Germania e Italia*, against foreign rule, and joined the Garibaldian forces, fighting with them again in 1866. In this year he became editor of the *Gazzetta Rosa*, and both there and in the *Gazzetta di Milano* wrote numerous bitter lampoons against the monarchical national gov., his policy being always democratic and radical. In 1872 he entered Parliament as deputy for Corteolona, and on the death of Bertani in 1886 became leader of the party of the extreme Left, succeeding in greatly strengthening the party and increasing his own popularity. He was a violent adversary of Crispi, and was famous for the frequent lawsuits and duels in which he was involved. He was killed in a duel with Count Marcola, editor of the *Gazzetta di Venezia*. He wrote some beautiful lyric poetry, including *Anticaglie* (1879) and *Il Libro dei Versi* (1898); and among his dramas are *Aleibade*, *Messeni*, and *Cantico de' Cantici*. His works in nine vols. were pub. at Milan in 1896.

Cavalry. The hist. of C. can be said to begin only with the beginning of the age of chivalry. It is, of course, obvious that the horse was used in armies previous to this, but it had not been used for the purpose of mounting a number of men who by sheer weight and impetus would carry all before them. Horses had been employed in warfare as far back in the hist. of warfare as we can go, but their employment had been various. The earliest type of horse of which we have any evidence was incapable of carrying a well-armed man of the period. In the armies of Egypt and Assyria we find the horse used, but only as a chariot-pulling animal. Later we find a number of mounted men used in the army, mainly, however, for the purpose of strategy. It was necessary to know what the movements of the opposing forces were, and for this purpose mounted men were used. With the beginning of the age of chivalry, however, we find that a battle resolves itself very largely into a matter of C. charges. The knights in armour, mounted on great chargers which were themselves at a later date clad in armour, swept down upon the infantry and usually carried the position. This was practically the state of affairs during the fifteenth century, but the overthrow of the feudal C. had by then become largely a matter of time. The new tactics had shown that bowmen and infantry could disperse and rout a cavalry force. Thus at Stirling Bridge the 'schiltrons' of Wallace, at Crécy the use of archers

protected by stakes, and at Bannockburn the tactics of Robert Bruce had broken the furious charges of feudal C. Other tactics would have to be adopted by the C. before they could again vaunt their superiority over the infantry. Other influences also were at this time at work. The introduction of gunpowder and the consequent use of fire-arms had led to many innovations in the art of war. The C. began to be armed with fire-arms in addition to the lance which they carried, and their greater speed and mobility gave them a great advantage over the foot soldier. For the next century a duel was waged between the C. and the infantry.

with exceedingly great advantage. The Ironsides of Cromwell showed their fearlessness and courage in the charges against the pikemen and musketeers. They had certain advantages over the C. of modern times, but on the whole their work was as dangerous as it was until comparatively recent times, and they proved themselves to be the most useful 'arm' that a general had. But again C. declined: during the wars of the early years of the eighteenth century they found insufficient employment, and during the Seven Years war they were found to be lacking in dash and ignorant of manoeuvring. Under Frederick the Great the Prussian C. reached again a



'THE CHARGE OF THE LIGHT BRIGADE AT BALAKLAVA'

A painting by R. Caton Woodville.

First was invented some means of attack to give the C. an advantage over the infantry, and in turn the infantry were equipped to overcome the new tactics of the C. By this time both were armed with fire-arms, and also the use of cannon had become common to both. The C. again triumphed, since their mobility gave them a great advantage. Again, the influence of the religious wars of the seventeenth century on C. cannot be overrated. It was essential that the C., having charged the enemy, should not go too far either in pursuit or in search of plunder. The battle of Lewes may be quoted as an example where the C., having overthrown the enemy, lost the day owing to too prolonged a pursuit. The mercenary soldiers had already shown their superiority to feudal levies, but they had also shown that they were not to be depended upon in the matter of a quick return to the battlefield. The C. of the Protestants in the Thirty Years war, however, showed that, actuated by the highest motives of patriotism, they could be used

high standard, only to decline at the end of the Seven Years war. During the early stages of the revolutionary wars C. was practically non-existent. A species of mounted infantry was used, but these were mounted only for the advantages of mobility. Under Napoleon the work of the C. was revived, and the C. were used in combination with the artillery. The mass of infantry to be charged were first of all riddled by a heavy artillery fire, and then the C., which had been massed within easy striking distance, were launched against it, to continue and finish the work made easy by the disorder and confusion created by the fire of the artillery. During the campaigns of the nineteenth century the C. did not on the whole play an important part. Following immediately on the Napoleonic wars they were practically disbanded, and during the latter part of the century the question of substituting a large degree mounted infantry was mooted, and the plan found strong advocates. For it was argued that the conditions of warfare had changed in such a

degree that the use of C. in the sense that it was used by Napoleon was no longer possible or necessary. The only use of mounted men is for purposes of mobility, and a large number of supernumerary C. were, until the First World War, always necessary at the beginning of a campaign. It was always found to be easier to recruit efficient riflemen for mounted infantry than it was to recruit trained C. men. The S. African war of 1899-1902 again saw a great revival of C. owing to the ideal nature of the area of operations for their employment. On the Brit. side many yeomanry regiments were sent to the front and many C. units were raised in S. Africa. The Boer force was practically a mounted infantry army. Just before the First World War it was maintained by a large number of authorities that we had again reached a normal stage in the evolution of C., and that the concentrated fire of shrapnel and quick-firing guns would make it possible for the C. to support the work of the artillery and penetrate the masses of infantry confused by the artillery fire, i.e. that it was possible to return to the evolutions of Napoleon. In the First World War, however, C. played only a minor part on the W. front. At the outset they performed their traditional function of moving well in advance of the infantry as a protective screen and then drawing off to a flank as the opposing infantry drew towards each other. On the W. front, however, the early settling down to trench warfare precluded C. action in any form, but on the E. front all combatants were able to employ C. at all times. The best C. exploits of the war were those of the Brit. in Palestine and Mesopotamia. But C., as an effective arm, has all but ceased to be of importance in a 'major' war. The experience of the First World War showed that tanks and armoured cars, being far less vulnerable and far speedier, should take over some of the duties of reconnaissance, pursuit, and protection previously performed by C. C. played no part in the defeat of the Sp. Republicans by Franco (1936-39), the chief factor in his victory being the Ger. and It. air forces. Similarly, in Poland, the Ger. air raids on that country ended the campaign in three weeks (1939), combined with attack by massed tanks and motorised units. There were C. units on the Polish side, but they may almost be said to have been reminiscent of the Middle Ages. In the Brit. service the C. estab. was greatly reduced in the first decade after the First World War, and, later, most C. regiments were converted into armoured car or light tank units (see also ARMY). Armoured cars have in recent years been found invaluable in such differing types of country as the plains of Iraq and the mts. on the N.W. frontier of India. A Brit. C. regiment is divided into four 'squadrons,' each of which has two 'troops.' In the field each brigade of C. is, or was, supported by a battery of horse artillery.

In the U.S.A. C. first came to the fore during the Civil war. It was efficient in

all branches and adaptable to all circumstances. Sheridan's pursuit of Lee in 1863, Stuart's impenetrable screen in 1863-64, the C. battle of Brandy Station (June 9, 1863), and Sheridan's destruction of Early's army in the Shenandoah were all first-class operations. The wide spaces of America provide a natural theatre for C. action which the C. was not slow to demonstrate in Indian wars. In the modern U.S. Army the tank service forms part of the infantry arm.

It is often said that the experience of the First World War sounded the knell of C., and that the fundamental duties of C. can now be more efficiently performed by the aeroplane and the armoured car. On the W. front, C. was of the first importance in the earliest phase when the opposing armies were as yet feeling their way. Afterwards, during the protracted period of position warfare, they could act only as infantry and as a mobile reserve. It is clear from a report of Sir Douglas (later F.-M. Earl) Haig to his gov. that during the period of infantry and artillery action the true function of the C. corps was to move on the flanks, and he makes the implicit admission that as there were no flanks, or, in other words, as the flanks rested on neutral States or impassable obstacles, that function was in abeyance. In the final period, the C. were ready to revert to their historic rôle of pursuers, but by that time the morale of the Ger. armies was broken. Many of the foremost allied leaders testified to the great service performed by the C. in the early weeks of the operations on the W. front; Sir Douglas Haig stated that 'it has been proved that C., whether used for shock effect under suitable conditions, or as mobile infantry, have still an indispensable part to play in modern war.' Gen. Pershing observed that 'the splendid work of the C. in the first few weeks of the war more than justified its existence and the expense of its upkeep in the years preceding the war.' Gen. von Kluck, the commander of the First Ger. Army, lamenting his lack of C., stated that during the Brit. retreat of Aug. 1914, the chief factor that enabled the Brit. Army to escape was that his (von Kluck's) forces did not possess the effective means of compelling it to turn and resist, namely, the three divs. of Marwitz's C. (*Journal of the U.S. Cavalry Association*, April 1920). More favourable opportunities occurred in Palestine, where the Brit. yeomanry co-operated with the Australian and New Zealand mounted infantry. The former were, of course, armed like the regular Brit. C., but the dominion forces were armed with rifle and bayonet, and it was only later that the Australian Light Horse Div. were trained in the use of the sword, and that the dominion troops became gradually assimilated to C. proper. At the commencement of the operations in Palestine, the yeomanry attacked with the sword, advancing in the customary double rank formation; whereas the dominion troops advanced at a rapid walking pace only, with rifle slung and

bayonet held in the hand. The success of the attacks was due largely to the thorough preparation by machine-gun and field-gun fire. Later, under Gen. (later Lord) Allenby, the greatest C. leader of modern times, the C. reverted, with *éclat*, to their appropriate rôle of pursuer, and in this theatre of operations with entire success. It is important to bear in mind that the Fr., Belgian, and Ger. military authorities, almost of necessity from the geographical position of their nations, considered a warfare of position as the most probable form for the next war in which their nations were likely to be concerned. In the training of Fr. C., the tactical principles on which emphasis is laid are rapidity, mobility, and ability to manoeuvre, always with a view to actual fighting on foot; and these tactics must conform to the modern development of fire power. In the frontal attack, dismounted C. units should, according to the Fr. theory, act in co-operation with units armed with machine guns, the function of the whole force being to turn the enemy's flanks and to cover the advance of reserve units. As a result of the Russo-Jap. war, where the C. of both belligerents was so obviously inferior, continental opinion, especially that of the Ger. general staff, was that only a first-class and highly trained C. would be of any real use in a modern major war. Again, the view of the Ger. staff was that while charges by regiment and brigade were still feasible the charge by div. was a past chapter. They regarded the lance as superior to the sword, but argued that only shaken and surprised infantry were really vulnerable to C. attack. Finally, they held that C. must be able to fight mounted as well as dismounted, and not relegated to the rôle of secondary infantry. The view of one school of Brit. thought after the First World War was that while C. had to some extent been superseded, as a primary factor of strategical reconnaissance, by the air arm, this supersession really operated to help the C., and permitted it to develop still more fully its capabilities in tactical reconnaissance—a function which the aeroplane could not perform at all. Modern Brit. cavalry experts were opposed to mixed brigades and favoured the adoption of divs. of three brigades of C. instead of four, each brigade to consist of three regiments, so that the unit could be easily controlled by one leader, the regimental commander. Light guns, such as the 13-pounder rather than the 18-pounder, were considered the most suitable weapon for artillery of the C. div. of the future, the essential requirement being that the guns should keep up with the C. A proportion of howitzers should be added for the purpose of overwhelming enemy detachments which could not be reached by field guns of flat trajectory. Finally, each machine-gun squadron should carry no more than twelve guns, each squadron being organised into three troops of four guns each. There was no finality in these views, which were essentially those of the traditional Brit. C.

school. They favoured a C. div. exclusively composed of that arm, machine-gun units and other auxiliaries being under the control of the div.; while armoured car units and motor machine-guns should not be included, but only attached as occasion may require. The extensive use of aerial reconnaissance in the Second World War largely discounted the view of the limitations of the air arm in that sphere noted above. C. played no part in the operations on the W. front in the Second World War, but it rendered considerable service on the E. front. Thus C. were combined with light mobile units in the operations of Marshal Rokossovsky against the Ger. Ninth Army in the summer offensive of 1944, and again in his operations to outflank Minsk and Bobruisk in the same offensive. Russian C. were often used in great enveloping manoeuvres to cut off the retreat of Ger. forces in the Caucasus and other regions of the S. Russian front. For the hist. of individual C. regiments, see DRAGOON; DRAGOON GUARDS; GREYS; SCOTS; HUSSARS; LANCERS; LIFE GUARDS; YEOMANRY. See Maj. M. W. Nicholson (U.S. Army), *Modern Cavalry*, 1922.

Cavan, mrlt. tn. on a trib. of the Annalen, in the co. of Cavan in N. Ireland. Most of the co. offices are in C., but a grammar school, founded by Charles I. (rebuilt in 1819), is the most conspicuous building. In the prov. agriculture is the chief industry, but the climate is moist and cold, and the soil poor. Besides potatoes and oats, flax is cultivated for a declining linen industry. Coottehill and Belturbet are the other tns., the Erne and the Woodford the other rvs., of importance. Pop. of co. 76,000, of which 80 per cent are Rom. Catholics; of tn. 3000.

Cavan, Frederick Rudolph Lambart, tenth Earl of (1865–1946), Brit. soldier, colonel of the Irish Guards and of the Beds and Herts Regiment. He served in the S. African war 1899–1902, and was mentioned in despatches. Commanded 1st Battalion Grenadier Guards 1908–12. Had retired before the First World War, but returned to active service, and commanded the Brigade of Guards, and later the Guards Div. and the 14th Army Corps. He was sent to Italy to take command of the Brit. troops in the operations on the Piave (1918). After the war, he was general officer commanding in chief, Aldershot, 1920–22, and chief of the Imperial General Staff, 1922–26; head of the War Office section of the Brit. delegation to the Washington Conference, 1921. Promoted to general in 1921; promoted to field marshal 1932.

Cavatina, term applied in music to a simple melody, having no second nor a *da capo* part. It is also sometimes used of any kind of light and smooth air, and frequently of those occurring in a grand scena. It is much the same as an arietta or a short aria in one section. The term is used by Mozart. In eighteenth-century opera a C. is found inserted as a relief in a long stretch of orchestrally accompanied recitative. C. also denotes a piece of instrumental music, as for example in

what is popularly known as Raff's C., the piece by which that composer is chiefly remembered.

Cave, Edward (1691-1754), printer, combined both at Norwich and London the functions of journalist and printer. In 1731 he began to pub. the *Gentleman's Magazine*, in which parl. debates were for the first time reported at some length. C. d. 'with his hand 'gently pressing' Samuel Johnson's. The latter had become his parl. reporter in 1740, and afterwards his friend.

Cave, George, first Earl (1856-1928), Eng. lawyer, b. in London, second son of Thomas Cave, M.P. Educated at Merchant Taylors' School, and at St. John's College, Oxford. Called to the Bar 1880; took silk 1904, and enjoyed for many years a considerable Chancery practice. M.P., Kingston div. of Surrey, 1906-22. Solicitor-general in Coalition Gov. and knighted 1915. In 1916 became home secretary; in 1919 a lord of appeal in ordinary. Lord chancellor in Bonar Law's ministry, 1922; retained that office in Baldwin's till 1924. See Sir C. Mallet, *Lord Cave: a Memoir*, 1931.

Cave, William (1637-1713), divine, took his M.A. degree at St. John's College, Cambridge, in 1660. He was vicar of Islington 1662-91; rector of All-Hallows the Great, Thames, 1679-89; vicar of Isleworth 1690-91. The twelve books he wrote on early church hist. were once standard works.

Cave Animals, term which is applied equally to animals whose remains have been found in a fossil state in caves and to living creatures which have adapted themselves to an existence in the dark and quiet shelter discovered by their ancestors. They are often distinguished from their kindred by the specific term *spelæus* (Lat. *spelæum*, a cave), e.g. the fossil hyena and tiger are known as *Hyæna spelæus* and *Felis spelæus* respectively, while the living blind-fish is called *Amblyopsis spelæus*. Their frequent lack of vision has also been obtained for many of them, as for deep-sea and underground dwellers, the prefix *Typhlo-* (Gk. τυφλός, blind), e.g. *Typhlichthys*, a genus of blind fishes. The chief characteristics of animals of this type are their reduced or absent eyes and consequent well-developed sense-organs, such as antennæ and feelers, lack of colour, and their predaceous carnivorous habits occasioned by lack of vegetable matter in the darkened home. Among the gastropod molluscs sev. species of snails have been found in Austrian caves which have developed blindness as the result of their mode of life. Blind cave-dwellers are represented also in the Crustacea and Arachnida by sev. species, notably by *Cambarus stygius* and *Antrobia mammothia* respectively. In the orthopterous insects a genus of small cockroaches of a peculiar nature has been discovered in caves of the Philippine Is.; the females are devoid of sight and of all power of flight. The Carabidae and Silphidae are well-known families of coleopterous insects which include sev. cave-dwellers, usually sightless, e.g. in the

carabid genus *Anophthalmus* found in Europe and America, and the Amer. genus of Silphidae, *Adelops*. Rising higher in the animal world we come to the phylum Pisces, and here there are numerous fishes which shun the light and prefer a cavern for a home. The *Amblyopsis*, which occurs in the Mammoth Cave of Kentucky, is a colourless fish, about 5 in. in length, in which the eyes and optic nerve are imperfect; in the same family, i.e. Amblyopsidae, are found the *Chlorogaster*, which has normal sight, and *Typhlichthys*, a blind and colourless fish whose home is near the Mississippi. A blind salamander, *Typhlotriton spelæus*, inhabits the Rock House Cave in Missouri, and other cavernicolous amphibians are the *Typhlomolge kathburni* and *Proteus anguinus*, the olm, the latter being a native of Carniola. Its eyes are completely hidden, and when exposed to the light the colourless creature turns black. If such C. A. have lost their sight as a result of living for many generations in the dark they would provide evidence in favour of Lamarck's theory of inheritance of acquired characters. It is, however, possible to adopt the opposite view that the ancestors of these animals became blind as the result of a mutation (sport), and that they could then survive in dark places only, where functional eyes would in any case be useless.

Caveat, formal notice or caution given by a party interested, to a court, judge, or public officer, against the performance of certain judicial or ministerial acts. In a more restricted sense a C. denotes (1) a caution entered in the Probate, Divorce, and Admiralty Div. to stop the granting of probates of wills or letters of administration; (2) a notice given to the bishop by a party who disputes a particular right of presentation to prevent the institution of a clerk to a benefice; and (3) a notice lodged at the patent office to prevent the registration of any invention under the patent laws.

Caveat Emptor (Lat., let the buyer be on his guard), legal maxim which in the law relating to a contract for the sale of goods means that a purchaser must take all reasonable precautions in buying from another, for as regards the quality of a thing sold in the general circumstances of the sale he will not be allowed afterwards to repudiate the sale because he has not obtained all he wants. The Sale of Goods Act, 1893, however, has destroyed the maxim of some of its force by implying in every contract of sale conditions that the goods sold shall correspond to their description, that they shall be reasonably fit for the purpose for which the buyer wanted them, provided he made that purpose known to the seller, that the bulk shall correspond to the sample, and that the seller has a right to sell the goods; with the result that on the breach of any such condition the buyer can rescind the contract.

Cavedone, Giacomo (1577-1660), It. painter, b. at Sassuolo, near Modena; studied under the Caracci and Guido, and was much influenced by Titian, whose

works he studied at Venice. Most of his work was done for churches in Bologna, and is in both oil and fresco. His colouring, design, and execution are all good. His best pictures are: 'The Nativity,' 'The Virgin and Child in Glory,' 'The Holy Family,' and 'The Adoration of the Magi.'

Cavell, Edith Louisa (1865-1915), nurse, b. Dec. 4, at the vicarage at Swardeston, Norfolk; eldest daughter of the Rev. Frederick Cavell. Educated there, in Somerset, and in Brussels. In 1895 she entered the London Hospital as probationer. After experience of many hospitals in England, she went to Brussels in 1906 to assist in establishing a modern training school for nurses. Was appointed, 1907, first matron of Dr. Depage's clinic—the Berkendael medical institute. Also organised the hospital of St. Gilles. In Aug. 1914, at the outbreak of the First World War, Dr. Depage left to organise military hospitals, and Miss C. remained in charge of the institute, which became a Red Cross hospital for both Gers. and their enemies. Many soldiers were left behind in the retreat of the Fr. and Brit. forces, and some of those caught were executed. On Aug. 5, 1915, Miss C. was arrested and placed in solitary confinement in St. Gilles prison. On Oct. 7, she was one of thirty-six brought to trial before a court martial. Mr. Brand Whitlock, the U.S.A. Minister, after sending two letters to Baron von Lancken, civil governor of Belgium, offering to take charge of her defence, was informed she had confessed. She had been defended by Sadi Kirschen of the Brussels Bar—who, however, was not allowed to see her beforehand, or to inspect documents. She was charged with having assisted 130 persons to escape from Belgium. The prosecution were assisted by her own statement that she had received letters of thanks from the repatriated. The trial ended on Friday, Oct. 8. At eight in the evening of the 11th, the Amer. legation learned that she had been condemned to death three hours before and would be shot at two the next morning, Oct. 12. She was allowed to see the Rev. H. S. T. Gahan, and the sentence on her and one other was carried out as arranged. On May 15, 1919, her body was brought to Norwich Cathedral. A memorial to her, designed by Sir E. L. Lutyens, was erected after the First World War, near Trafalgar Square.

Cavendish, surname of the ducal house of Devonshire (q.v.).

Cavendish, Lord Frederick Charles (1836-82), second son of the seventh duke of Devonshire. He married a niece of Mrs. W. E. Gladstone. He was private secretary to Lord Granville, 1859; elected M.P. for Barrow-in-Furness, 1865; was Gladstone's private secretary, 1872; financial secretary to the Treasury, 1880. In 1882 he was chosen by Gladstone to succeed W. E. Forster as chief secretary to the lord-lieutenant of Ireland, Earl Spencer, not only as a most capable and thoroughly high-minded man, but as having framed a financial scheme for

land purchase. He landed at Dublin on May 6; he passed the afternoon with Lord Spencer in Dublin Castle, and about six o'clock he walked with the under-secretary, Thomas Henry Burke (q.v.), into Phoenix Park. They were there set on and brutally murdered by a gang of assassins, belonging to the secret society of Invincibles, in front of the viceregal lodge. The weapons used were amputating knives specially imported for the purpose. James Carey, a member of the Dublin corporation, turned informer, twenty persons were arraigned, and five were executed and others sentenced to penal servitude. Carey sailed for S. Africa, but was murdered on board by Patrick O'Donnell, who was hanged in 1883. The assassins did not know who Lord Frederick was, but they meant to murder Burke. The late secretary, Forster, had narrowly escaped assassination. The murder had far-reaching political consequences for Ireland, and 'Well has it been said that Ireland seems the sport of a destiny that is aimless' (Morley, *Life of Gladstone*). Lord Frederick is buried at Chatsworth, and a fine statue is erected to his memory at Barrow-in-Furness. Piggott's forged letter of C. S. Parnell condoned this murder.

Cavendish, George (1500-62?), Eng. historical writer, was the eldest son of Thomas C., a clerk in the Exchequer. He married Margery Kemp, a niece of Sir Thomas More, and became gentleman-usher to Cardinal Wolsey, being wholly devoted to his service through prosperity and disgrace. After Wolsey's death he wrote his patron's biography, which was circulated in MS., and probably was made use of by Shakespeare in his portions of *Henry VIII*. In 1641 it was first printed as *The Negotiations of Thomas Wolsey*; the genuine text, however, did not appear till 1810, a better ed. appearing in 1815. It is a valuable authentic record of the period.

Cavendish, Henry (1731-1810), Eng. natural philosopher, b. at Nice, educated at Cambridge. His dislike of strangers amounted to an eccentricity. A millionaire and the possessor of a unique library, C. devoted his whole life to chemical and physical research, and found time also to work at mathematics and to read papers before the Royal Society. Not only did he discover the extreme lightness of hydrogen—which led at once to balloon experimenting, etc.—but before 1783 he had ascertained the constituents of water and atmospheric air, and had conducted his famous experiments on the density of the earth. Sir Humphry Davy spoke enthusiastically of the extreme accuracy of his work.

Cavendish, Margaret, Duchess of Newcastle (c. 1625-73), was the second wife of the duke of Newcastle (1592-1676), and is best known as the writer of his life. Formerly she had been maid of honour to Henrietta Maria. Husband and wife were inordinately fond and proud of one another. Walpole describes her as a 'fertile pedant' with an 'unbounded passion for scribbling.' Her maids were

expected always to be prepared to 'register her Grace's conceptions.' Her works are marred by diffuseness and illogical sequence of thought. Sir A. W. Ward, however, describes the *Life* of her husband as 'one of the lesser classics of English biographical literature' and Charles Lamb's exuberant appreciation of the work and of its authoress the 'princely women, the thrice noble (her husband being duke, marquess, and earl of Newcastle) Margaret Newcastle' is well known. Her *Select Poems* were ed. by Brydges in 1813, and her *Autobiography* in 1814. The latter, ed. by Lower, was pub. together with her *Life of the Duke of Newcastle* in 1872.

Cavendish, Thomas (1560-92), circumnavigator, commanded a ship in Sir Richard Grenville's expedition to Virginia (1585), and in the following year fitted out three small ships from Plymouth, in which he sailed round the world (1586-88) by way of the Magellan Straits, the E. Archipelago, and the Cape. During this voyage he discovered Port Desire, Patagonia, burnt three Sp. cities, and captured Sp. treasure. He d. at sea off Ascension, broken-hearted because his second expedition was not so successful as the first.

Cavendish, William Duke of Newcastle (1592-1676), was educated at St. John's College, Cambridge. James I. pleased with his learning and charm of manner, made him Viscount Mansfield, and Charles I. appointed him governor of his son Charles in 1638. C. had previously entertained his sovereign at Welbeck, when Ben Jonson, whom he patronised, composed the masque. When the Civil war broke out he proved a staunch Royalist, and made a generous contribution of £10,000 to the king's treasury. Collecting troops at his own expense, he won Yorkshire for his cause by the victory of Adwalton Moor (1643). In that year he captured Hull, but in the following, after the rout of Marston Moor, went abroad, where he lived in straitened circumstances till the Restoration, when he returned to England. In spite of his splendid devotion, King Charles II. restored to him only a part of his estates.

Cavendish, Sir William (c. 1505-1557), founder of the family of C. b. at Cavendish. Second son of Thomas C. of Cavendish, clerk of the pipe, and brother of George C. (q.v.). Treasurer of the royal chamber under Henry VIII., Edward VI., and Mary I. Was one of the commissioners appointed by Henry VIII. to suppress the monasteries. Was three times married, his third wife being a Derbyshire heiress. With the aid of her purse he planned the sumptuous mansion at Chatsworth, which his wife completed. See Kennet's *Memoirs of the Cavendish Family*, 1737; J. Grove's *Lives of all the Earls and Dukes of Devonshire*, 1764.

Cavendish-Bentinck, see BENTINCK.

Caversham, Baron, see KNOLLYS, FRANCIS.

Caversham, tn. in the Henley div. of Oxfordshire, England, on R. Thames, opposite Reading. Most of it is now

included in the co. of Berkshire. Pop. 10,000.

Caves, or **Caverns** (Lat. *cavus*, hollow), hollow places formed in the earth or in rock. They may be produced by the action of water or by the destruction and displacement of strata through an earthquake or landslide. The regular beating of waves upon the seashore wears away the softer portion of the cliff until cavities are formed. Fingal's Cave, Staffa, is an excellent example of marine erosion. The sand and gravel, carried up by the sea, have also a great eroding power upon rocks. In rock-salt dists. large C. are formed owing to the free solubility of the sodium chloride in water. In France and Switzerland large caverns have been formed under the glaciers, owing to the shifting of the ice. C. are, however, more frequently formed by the chemical than by the mechanical action of water. Carbonic acid, which is present in most waters, derived either from the air or from decaying organic matter in the soil, acts upon mineral rock, forming salts, which are carried away in solution, leaving cavities behind. Large subterranean galleries, caverns, and channels have been formed in various dists. by underground streams and rivs. A riv. that has left its course above ground eats its way through the earth, until it can finally empty itself into the sea. Whenever such a riv., for some natural cause, has abandoned its subterranean water-course, the channel it has occupied gradually dries up, and tortuous underground passages remain, linking together the C. previously made by the water. The holes through which the rivs. have descended on their downward course below the earth are known as sink-holes. The direction of the caverns and channels can frequently be ascertained above ground by examination of these entrance-holes. Fine specimens of such sink-holes are found in Kentucky and Florida. In limestone dists. calcareous deposits are left on the walls of subterranean C. This is due to a double chemical process. First, the carbonic acid acts upon the calcium carbonate (or limestone), forming the soluble bicarbonate. When this solution is left standing on the walls of the cave the reverse process takes place, and glistening crystals of calcium carbonate remain. If water, laden with calcium bicarbonate, comes trickling through the roof of the cave, in the course of ages similar deposits are formed in the shape of icicles. These deposits slowly grow in size as the water drips from them, and where the solution falls on the floor of the cave dome-shaped mounds appear. The incrustations hanging from the roof are known as stalactites, and those on the floor stalagmites. Sometimes the stalactites and the stalagmites may become united, when it appears that the roof of the cave is supported by pillars. Sometimes these formations are of a pure dazzling white but more often are coloured by some foreign matter in the water. When the cave is lit up artificially, the effect is extremely beautiful. Some of the finest

specimens of such C. are to be found in Austria, whilst in England most beautiful specimens can be seen at Cheddar. C. are also formed under sheets of lava in volcanic dists., such as parts of S. America and Iceland. The lava collects over a mass of ice (or over snow which is then solidified); melting of the ice subsequently takes place, and a hollow is left beneath the lava. The Fossa della Palomba, at Etna, was probably formed by the evaporation of water below the lava into steam, which afterwards found an outlet and escaped. The remains, such as bones and rude implements of

bones. One of the largest and most famous C. in the world is Mammoth Cave in Kentucky, U.S.A., situated some 85 m. S.W. of Louisville. It consists of a perfect maze of great chambers, grottoes, and domes linked by numerous passages and galleries. The extent is over 4 m., and was evidently formed ages ago by the action of water in the prevailing limestone formation. The main cave is over 40 ft. wide by 300 ft. in length and about 125 ft. high. One of the domes attains a height of 300 ft., and there are sev. others only slightly less in height. In some of the grottoes there is a dazzling



INTERIOR OF A CAVE, SHOWING STALACTITES AND STALAGMITES

domestic use, that have been found by means of excavation prove that men in prehistoric times inhabited C. Human bones have been discovered, embedded sometimes in mud and frequently in calcareous matter. This latter fact—that bones have been covered in limestone crystals—shows that the C. must later have been deserted, and the stream of water returned to its former subterranean course. Bones of mammals belonging to the Pleistocene period have also been found. From the remains of bones discovered, it appears in general that the animals that visited C. resembled large hyenas or bears, but in a few C. remains of herbivorous animals have also been discovered. In the C. at Kirkdale, near York, as many as 300 hyenas have from time to time been found. The bones in the Australian C. have obviously belonged to kangaroos or allied genera of marsupials. In the Brit. Is., thirty-three different species of mammals and five of birds have been deduced from

formation of stalagmites and stalactites. The cave contains a stream which links up with Green R., which is not far away. An interesting development in evolution is that in this cave stream, shut off from the light there are found a number of species of blind fish. Mention should be made of the famous C. in Bermuda: these include Shark's Hole, Walsingham C., the Leamington C. and Crystal C.—these last perhaps the finest in the Is. In Jamaica are the Oxford C. in the May Bay mts. 1000 ft. above sea level. The galleries and halls, which extend for sev. hundred yards under the mts., contain curious stalagmites and stalactites. *See also CAVE ANIMALS. Consult Sir W. B. Dawkins, Cave Hunting: Researches on the Evidence of Caves respecting the Early Inhabitants of Europe, 1874; Hovey, Celebrated American Caverns, 1882; A. Badin, Grottes et cavernes, 1886; E. A. Martel, Les Abîmes, 1886, La Spéléologie au vingtième Siècle, 1905-6, and La France ignorée, 1928; O. Penzance, Kent's*

Cavern, 1894; F. Simony, *Die Höhlen im Dachstein*, 1913; N. Casteret, *Ten Years under the Earth*, 1939, and *My Caves*, 1947; A. H. Brodrick, *The Caves of Lacour*, 1947.

Caves of a Thousand Buddhas (Ch'ien-to-tung), most famous repository of early Chinese painting, situated in the cliffs of a riv. valley, on the edge of a sandy desert, 25 m. from the small tn. of Tunhuang, in N.W. Kansu, 710 m. from Lanzhou. They are really Buddhist shrines, over 400 in number, hollowed out of gravel rock. They vary greatly in size, the largest containing images of Buddha more than 100 ft. high, the smallest being little more than niches in the wall. Although the earliest date from the middle of the fourth century A.D., the majority belong to the Tang (618-936) and Sung (960-1276) dynasties. The C. were dug out and painted by the monks and usually paid for by high officials and wealthy merchants, whose portraits and those of their families are often depicted along the walls. Many of the images have disappeared or been renovated, but the wall paintings, depicting secular and religious scenes, are still in a wonderful state of preservation, far better indeed than those at Ajanta (q.v.). For many centuries the C. were one of the greatest religious centres in all Asia, visited by monks from many countries. But in the twelfth century, probably owing to unsettled political conditions, they were abandoned to the mercy of plundering bands and priests of other religions and to the destructive agencies of wind and sand. First reported to the W. world in 1892 by an Englishman, Capt. Bower, the first serious work on them was done by Sir Aurel Stein (q.v.), who found in the long-buried library a treasure-house of early Buddhist and Asiatic literature, which has since yielded thousands of vols., many of the most important of which are now in the Brit. Museum.

Cavia, see CAVY.

Caviare, roe of the sturgeon prepared for eating. It is a favourite *hors d'œuvre* or savoury. The variety known in Russia as *ikra*, which is loosely granulated and almost fluid, is the best. A coarser kind called *pajussnaral* is a common article of food in E. Europe. Hamlet's remark that 'His play . . . was caviare to the general' proves that it was a known delicacy in Shakespeare's day.

Caviglia, Enrico (b. 1862). It. soldier and senator, b. at Finalmarina, son of Pietro C. Educated at Military Academy of Artillery and Engineering and the School of War. Took part in the campaign of Eritrea, 1886-89. He followed the Jap. forces as a spectator of the Russo-Jap. war, and participated in the Libyan engagements of 1912; and in the First World War, as a major-general, he directed the decisive operations of the battle of Bainsizza (July 1917) and commanded the Eighth Army at the victory of Vittorio Veneto (June 1918). Nominated senator, Feb. 22, 1919—in

which year he was minister of war for some months. Drove D'Annunzio from Fiume, Dec. 1920. Marshal of Italy, 1926.

Cavite, cap. of the prov. of Cavite, Luzon, Philippine Is. It is situated on Manila Bay, 3 m. from the city of Manila, is a fortified seaport and a naval station of the U.S.A., the N. part of the tn. serving as a coaling station. It is an old tn. containing narrow streets and buildings of stone with upper storeys of wood; it possesses five churches and a high school. It is the chief naval base of the Philippine Is., and during the nineteenth century was the scene of political troubles. An Amer. squadron under Commodore George Dewey wrested it from Spain in May 1898. Pop. of the prov. 160,000; tn. 13,000. The chief products of the prov. are sugar, rice, coffee, and indigo. In the Second World War C. was captured by the Jap. on Jan. 3, 1942. Recaptured by Amer. forces on Feb. 13, 1945. See further under PACIFIC CAMPAIGNS OF FAR EASTERN FRONT, IN SECOND WORLD WAR.

Cavour, tn. of Turin, Piedmont, Italy, 7 m. S.E. of Pinerolo. It has marble and slate quarries, manufs. silk, and has a tanning industry. Pop. 7000.

Cavour, Camillo Benso, Count (1810-1861), It. statesman, b. at Turin, of anct. aristocratic family of Piedmont. He was educated for the army at the Military Academy at Turin till 1826, when he obtained a commission in the engineers and was engaged in works of defence at various fortresses. During his leisure he studied Eng. politics, and developed his strong liberal views which caused him to be regarded with suspicion. In 1831 he resigned his commission and devoted himself to social problems, practical agriculture, and foreign travel. He visited Paris and London, and gained a profound knowledge of European politics. He then managed his father's estates at Lizi, and founded the Society of Agriculture of Piedmont. In 1847 he started at Turin a newspaper, *Il Risorgimento*, for the purpose of spreading the ideas of constitutional reform. In Jan. 1848, the revolution in Sicily broke out, and C.'s speech on the constitutional questions had the utmost influence, not only on the people, but also on the Piedmontese king, Charles Albert, who was induced to grant a constitution. C. was not offered a seat in the first ministry, but his articles in his paper powerfully stirred the growing national enthusiasm against Austria and the tyrannies of the different kingdoms and principalities into which Italy was split up. He felt that the moment had come for war with Austria, and his skill and enthusiastic patriotism were powerful enough, and war was declared, 1848. The defeats at Custoza and Novara led to an armistice, the abdication of Charles Albert in favour of his son Victor Emmanuel II., and peace. C. was not disheartened, and threw himself still more ardently into his ideal of freedom from Austria and a united It. kingdom. His difficulties were immense, for he had, in addition to all the external

force of Austria and the supporters of the dynasties in Tuscany, Naples, etc., to face the divided policies of Mazzini and the republicans and the danger of an anti-papal and anti-clerical movement, which would have destroyed his schemes. In 1850 he became minister of agriculture and commerce, and in 1851 of finance, but he resigned on a difference with the Prime Minister, d'Azeglio. He then travelled in France and England to discover the trend of foreign opinion in regard to the It. problem. In 1852 he returned and was appointed Prime Minister, a post which he filled, with short intervals, till his death. He now began his masterly scheme of foreign policy, which made a united Italy possible, and ranks his name with Bismarck in later European history. He placed Sardinia and Piedmont among the powers by sending a well-disciplined force to the Crimea, while Austria remained neutral. He secured the benevolent neutrality of England, and in 1858 formed an alliance with Napoleon III., followed by a victorious joint campaign against Austria (Magenta and Solferino). The agreement of Villafranca, brought about by the sudden withdrawal of Napoleon, left Venetia in the hands of Austria, and bitterly disappointed C., who resigned, but later returned to office. He had ceded Nice, Garibaldi's bp., and Savoy to France in return for the alliance, for which he was upbraided by Garibaldi and his supporters. The adhesion of the central states of Italy followed, and the subsequent defeat of the Neapolitan kingdom in Sicily and Naples by Garibaldi. Save for the question of Rome and the papal temporal power and Venetia, C.'s policy had succeeded. Victor Emmanuel II. was king of a united Italy. A violent scene with Garibaldi in the Parliament broke him, worn out by anxiety and overwork. He d. at Turin in June. The regeneration of Italy had been his ideal, and his life's work had been given to that end. See De la Rive, *Le Comte de Cavour: récits et souvenirs*, 1892; G. Buzziconi, *Bibliografia Cavouriana*, Turin, 1898; Countess E. Martignengo Cesaresco, *Cavour*, 1898; D. Zanichelli, *Cavour*, 1905; A. J. White, *Early Life and Letters of Cavour, 1810-1848*, 1925, and *Political Life and Letters of Cavour*, 1930.

Cavy, or **Cavia**, genus of rodents found in S. and Central America, typical of the family to which the capybara or carpincho belongs. The Cs. have rough hair, well-developed ears, no tail, reduced toes, four on the fore feet and two on the hind feet. The guinea-pig, *C. cobaya*, known to us as a domestic pet, is descended from *C. porcellus*, the restless C., a species with greyish fur. The Patagonian C. is a large animal of the same family *Calidris*, but its two species form the genus *Dichotistis*; it resembles somewhat a long-legged hare, and has the same number of toes as *Cavia*. See also GUINEA-PIG.

Cawdor, par. of Nairn, Scotland, 3½ m. S.W. of Nairn. In the fine old medieval castle the murder of King Duncan is popularly supposed to have taken place,

but it actually occurred sev. centuries before the castle was built. Pop. 800.

Cawley, William (1802-68), Eng. regicide. He founded St. Bartholomew's Hospital, Chichester, 1826. C. was fined for refusing knighthood, 1829. He was M.P. for Chichester, 1827; for Midhurst, 1840, and was an active member of the Long Parliament. He was excepted from pardon, 1860, and fled to Belgium, and then to Switzerland, his property being granted to James, duke of York. See M. Noble, *Lives of the English Regicides*, i., 1798.

Cawnpore, or **Cawnpur**, city (and dist.) on the S. bank of the Ganges, in the Allahabad div. of the United Provs., India. Lucknow lies 40 m. to the N.E. Once an important frontier station under the E. India Company, it is now known as the junction of three railway systems, the East India railway, the Great Indian Peninsula railway, and the Bombay, Baroda, and Central India railway. The chief articles of commerce are various leather goods, such as harness and shoes. The dist. was once a centre of the indigo trade. Historically the city will long be remembered as the scene of a series of massacres of men, women, and children by the Nana Sahib in July 1857. Gen. Wheeler, who with a small force tried to protect the European residents, was encamped for twenty-one days in a bare field fully exposed to the fire of the insurgents. The well of C., which enjoys an evil notoriety because of the atrocious butcheries committed in its vicinity, is now marked by a white marble memorial. Pop. 245,000.

Caxamarca, see CAJAMARCA.

Caxias: 1. Tn. of Maranhão, Brazil, formerly known as Aldéas Atlas, on R. Itapicuru, 180 m. S.E. of Maranhão, with which it has riv. connection. It has rice and cotton industries. Pop. 70,000. 2. It. colony in Rio Grande do Sul, Brazil, 60 m. N.W. of Porto Alegre. Pop. 45,000.

Caxton, William (1422?-91), first Eng. printer, b. in Kent. In 1438 he was apprenticed to a rich silk mercer, and the latter dying in 1441, young C. was dispatched to Bruges to finish his term. Here he set up business for himself, and in 1464 and 1468 he was employed, as governor of the company of Merchant Adventurers, in negotiating commercial treaties with the dukes of Burgundy. The second time his mission was quite successful, and about 1469 he entered the household of the Duchess Margaret, sister of Edward IV., and wife of Charles the Bold of Burgundy, as commercial adviser. There is some doubt as to where C. actually learnt the art of printing. Many—among them Wynkyn de Worde, his disciple—say it was at Cologne, between 1471 and 1474, in company with Colard Mansion, who was his partner at Bruges, where he printed his first book in 1474 or 1475. This was a trans. of a Fr. romance entitled *The Recuyell of the Histories of Troye*. In 1476 his second printed work (completed in 1474) appeared, *The Game and Playe*

of *Chesse*, another trans. In 1476 C. was duly installed in Westminster. Lord Rivers's version of *The Dictes or Sayengis of the Philosophers*, 1477, has the distinction of being the first issue from C.'s printing press in his own country. Thence forward C. pub. some eighty books, many of them his own translations of famous Fr. legends and cycles of romance. His *Myrrour of the World*, 1481, is the first vol. he issued with woodcut illustrations, whilst as many as seventy woodcuts were inserted in his ed. of the *Golden Legend*—his own compilation from a Fr. work of the thirteenth century, containing lives of the saints. But by his fellow countrymen he will be remembered above all for his services in fixing the Eng. language, which was in a changing, somewhat chaotic condition, and in bringing the literary masterpieces within the reach of those who could read. Twice he printed Chaucer's *Canterbury Tales*, and he brought out also Gower's *Confessio Amantis*, 1483, and Malory's *Morte d'Arthur*.

Cayambe, volcanic mt. of the Andes, in Ecuador, practically on the equator, having a tn. of the same name (pop. 3000) at the foot. Altitude, 19,255 ft.

Cayenne, old name for Fr. GUIANA (q.v.).

Cayenne, port and the cap. of Fr. Guiana, at the mouth of the Cayenne on the N.W. of the is. of that name. It has two quays, but no docks, and only a shallow harbour. There is a wireless station. The staple exports are gold, cocoa, hides, and spices, whilst it imports wines, manufactured goods of all kinds, and corn. The inhab. live on bread and wine, and are subject to attacks of yellow fever. Pop. 13,800.

Cayenne Pepper, see CAPSICUM.

Cayes, Les, or Aux Cayes, seaport on S. coast of Hayti, 98 m. S.W. of Port-au-Prince. It is an episcopal see and exports coffee and logwood. Pop. 15,000.

Caxamarca, see CAJAMARCA.

Cayey, tn. of Puerto Rico, W. Indies, in the Central Cordillera, 25 m. S. of San Juan. It is a summer resort, and the centre of a rice and cotton dist. Pop. 12,000.

Cayley, Arthur (1821-95), Eng. mathematician, b. at Richmond, in Surrey. He was educated at King's College, London, and Trinity College, Cambridge. Senior wrangler of his year (1842), he was also winner of the Smith prize. He became a fellow of his college, but in 1846 he left Cambridge, and three years later was called to the Bar. He practised as a barrister for fourteen years, and then returned to Cambridge as Sadlerian prof. of mathematics. He wrote over 800 papers and memoirs, which, collected and pub. by the Cambridge Univ. Press, form a monument to his fame as one of the greatest of mathematicians. He possessed honorary degrees of almost every foreign univ., and was a fellow of the Royal Society. He d. at Cambridge, and a portrait and bust of him are to be found at Trinity College.

Caylus, Anne Claude Philippe de Tubières, Comte de (1692-1765), archaeologist, served with some distinction in the Sp. War of Succession (1709-14), and

then travelled abroad, visiting Greece and the E. His life was zealously devoted to the collection and study of antiquities and the promotion of art by patronage and writing, but he was also notorious for his intimate knowledge of the most disreputable side of Parisian life. His great work was his *Recueil d'antiquités égyptiennes, étrusques, grecques, romaines, et gauloises* (6 vols., 1752-55), but he also wrote a treatise on Rom. coins under the emperors, and a memoir (1755), in which he explained the exact nature of the encaustic painting of the ancts. The copper-plate engravings which he himself made of Bartoli's copies from anct. pictures are excellent.

Caylus, Marie Marguerite Le Valois de Villiette de Murçay, Comtesse de (1673-1729), Fr. noblewoman, b. in Poitou, the granddaughter of Théodore Agrippa d'Aubigné. She was taken to Paris and educated at court by her aunt, Mme de Maintenon, and in 1688 married the comte de C., who d. in 1704. She won a great contemporary reputation as a beauty and wit, and left a book which was ed. as *Souvenirs* by Voltaire in 1770.

Cayman, see CAIMAN.

Cayman Islands are three low-lying is. of the W. Indies, which were colonised by the Brit. from Jamaica, 178 m. to the E.S.E., of which they still form a dependency. Columbus, who discovered them, named them Tortugas after the turtles which abound, and which are even to-day the chief export of the is., together with tortoise-shell and shark skins. The first account of the is. is the report of the third voyage of Columbus on his return from Porto Bello to Hispaniola in 1503. Therein it is stated that the is. were covered with turtle, which swarmed also on the coasts in such multitudes as to look like ridges of rock. There is also an early description of Grand Cayman by Capt. Wm. Jackson who visited the is. in 1643 in an abortive attempt on Jamaica. He says: 'The island is much frequented by English, Dutch and French ships, that come purposely to salt up ye flesh of these Tortoises.' In 1655, when Jamaica was taken, the C. I. became a regular source of food supply for the soldiers and fleets of England cruising the Caribbean. Coconuts are grown on Little Cayman and Cayman Brac. The is. are rich in timber, and their inhab. are clever shipwrights. Georgetown is the chief tn. of Grand Cayman. The total pop. of the group is some 6800. No survey of the is. has yet been made, and area of the group is variously estimated to 92 to 140 sq. m.

Cayor, dist. of Senegal, Fr. Equatorial Africa, until 1883 part of the kingdom of Djolof. It is now under the direct control of France, and is traversed by the railway from Dakar to St. Louis. Pop. about 100,000.

Cayos, see CAICOS.

Cays, name given to the is. off the coast of Brit. Honduras. The prin. are Turneffe (a corruption of Terra Nova), St. George's Cay, Eng. Cay, and Ambergris Cay. They are much resorted to for bathing and fishing, and there are sev.

'week-end' residences in St. George's Cay. This latter was the headquarters of the log-cutters or bay-men as they were called. It was here that the bay-men and the Brit. sloop *Merlin* defeated a force of 2000 men under Gen. O'Neill, the governor of Yucatan, in a battle on Sept. 10, 1798, the anniversary of which is still annually celebrated in the colony.

Cayster, or **Caystus**, anct. name of a riv. of Asia Minor, 75 m. long, which flows into the gulf of Scala Nova, 35 m. S.E. of Smyrna. The modern name is Kuchuk Meirder (Little Meander).

Cayuga: 1. Co. of New York State, U.S.A., bounded on N. by Lake Ontario, and on W. by Lake C. It has deposits of salt, gypsum, and limestone. Area, 722 sq. m. Pop. 65,000. 2. Lake of New York State, U.S.A., lying partly in Tompkins co., and forming the boundary between C. and Seneca cos. Length, 38 m.; average width 4 m. At the head lies *Ithaca*.

Cazalès, **Edmond de** (1804-76), Fr. political writer, b. at Grenade, Haute-Garonne. He was an active revolutionist and a Rom. Catholic. In 1843 he took holy orders, became director of the ecclesiastical seminary at Montauban (1845), and served in the Constituent Assembly of the republic in 1848. Author of *Etudes historiques et critiques sur l'Allemagne contemporaine*, 1853, and *Nos Maux et leur remède*, 1874.

Cazalla de la Sierra, tn. of Seville, Spain, 40 m. N.E. of Seville in the Sierra Morena. It has Rom. and Moorish remains. Pop. 1500.

Cazembe, or **Kazembe**, formerly a native kingdom of Central E. Africa, adjoining Lake Mweru; now included in N. Rhodesia. It is named after one of the governing chiefs, whose settlement is near the Luapala R., about 30 m. S. of the lake. It produces manioc, maize, cotton, ivory, iron, and copper.

Cazin, **Jean Charles** (1840-1901), Fr. painter, b. at Samer, Pas-de-Calais, the son of F. J. C., a famous doctor; studied in France and England, where he came into contact with the Pre-Raphaelites. In 1889 he was made an officer of the Legion of Honour. Though his earliest works are on religious subjects, he excelled in landscapes into which figures were introduced. Among his best pictures are 'The Flight into Egypt', 1877; 'Ishmael', 1880; 'Souvenir de fête', 1881; and 'Journée faite', 1888.

Cazique, see **CACIQUE**.

Cazorla, tn. of Jaen, Andalusia, Spain, 41 m. S.E. of Linares, on the N. slope of the Sierra C. It has numerous anct. remains and two castles. Pop. 6200.

Ceadra, see **CHAD**, **St.**

Cean-Bermúdez, **Juan Augustin** (1749-1829), Sp. writer, b. at Gijón in the Asturias. He studied architecture and drawing, but not apparently with any great success, and, having a small pension from the gov., he was enabled to devote himself entirely to his literary pursuits as the historian of Sp. art. His first pub. was the *Diccionario Histórico de los mas ilustres Profesores de las Bellas*

Artes en España, 6 vols. 8vo (1800); and his others are: *Descripción Artística de la Catedral de Sevilla* (1804); *Descripción del Hospital del Sangre* (1804); *Carta sobre el Estilo*, etc., *de la Escuela Sevillana* (1806); *Diálogo sobre el Arte de Pintar* (1819); and lastly the *Nolucias de los Arquitectos y Arquitectura en España*, 4 vols. 4to (1829), a work founded upon materials collected by Eugenio Llaguno. He also pub. a memoir of his friend Jovelanos.

Ceanothus, genus of Rhamnaceae, of which the species, natives of America, are cultivated as ornamental shrubs. *C. Americanus*, red root or New Jersey tea, is a beautiful shrub when in flower and dyes wool of a fine strong nankin-cinnamon colour. Sev. other species grow well in this country and flourish in shrubberies.

Ceará, N. state of Brazil, bounded N. and E. by the Atlantic, Rio Grande do Norte and Paraíba, S. by Pernambuco, and W. by Piauí; lying partly on the great Brazilian plateau, its formation is that of terraces cut up by water-courses and high hills (2400 ft.); the climate is very hot and it is subject to severe and destructive droughts. On the higher ground, cattle are raised and some horses. The chief products are cotton, sugar, coffee, etc.; *manicoba*, or C. rubber, also grows there. The cap. is Fortaleza (q.r.), also called C. Pop. 1,994,000, chiefly coloured races and their mixtures with whites. Area 40,200 sq. m.

Ceará Mirim, tn. in Rio Grande do Norte, a N. prov. of Brazil. It takes its name from the riv. on which it is situated; it contains good pasture land, where cattle are raised, and manufs. cotton and sugar. Pop. 18,000.

Cebes, of Thebes, a Gk. philosopher, is the reputed author of the *Pinar*, or *Tabula*. In the Middle Ages this book was very popular, and was trans. into many languages, including Arabic. It professes to be an interpretation of an allegorical picture in a temple. Like *Pilgrim's Progress*, it draws a picture of the snares and temptations of this life, and concludes that the true end of learning is to mould character. C. appears in Plato's *Phædo* as an eager debater, zealous in his search of the highest virtue. This C. was a disciple of Socrates. However, although the author of the book was inspired by the Platonic theories of pre-existence and education, most scholars now attribute the *Tabula* either to another philosopher, Cebes of Cyzicus, time of Marcus Aurelius, or to an unknown author of the first century A.D.

Cebidae, large family of Primates which is divided into four sub-families, represented by the howling monkeys, sakis, teetees, and Capuchin monkeys. They inhabit trees of the Neotropical region and sev. fossil forms have been discovered.

Cebionites, genus of coleopterous insects of the family Malaodermidae, to which the glow-worms belong. They are moderate-sized beetles with soft skins, and are often found on plants in marshy places; the larvae are carnivorous. *Cebrio gigas* is common in France.

Cebu, Is., Philippines; area 2000 sq. m. It is intersected by fine mt. ranges. The chief products are sugar, copra, tobacco, and hemp. There is a flourishing export trade, and salt, pottery, and making of sacks are some of the most prosperous industries. Excellent mangoes abound, and good sponges are found off the coast. The Is. continued, under the U.S.A., the prosperity it enjoyed under Sp. rule. The first Sp. settlement was in 1565. Pop. 900,000 to 1,000,000. The cap. tn., Cebu, is situated on the E. coast, N. of the centre. It is a port of entry and a municipality; the port is well protected from storms. The streets are wide and well laid out, and good roads traverse the surrounding country. C. is an episcopal see, and the bishop's palace is famous for its internal decoration. The Augustinian church possesses the miraculous image of the Santo Niño. The leper hospital was removed in 1906 to the Is. of Culion. The cathedral, finished in the eighteenth century, contains a cross said to have been erected by Magellan, the great explorer, who was killed in the neighbouring Is. of Mactan. Jap. forces landed on C. Is. on April 11, 1942, but the Amers. recaptured it in 1945. Pop. about 80,000.

Cebus, genus of monkeys typical of the family Cebidae, which belongs to S. America. The species have a well-developed thumb, a hairy prehensile tail, and thirty-six teeth. They include the Capuchin monkeys (*q.v.*), and were at one time common in Britain as the companions of hurdy-gurdy players.

Ceccano, tn. of prov. Rome, Italy, on R. Sacco, 5 m. S. of Frosinone. The fine church of Santa Maria al Fiume was practically destroyed in the Second World War and the church of San Nicola was badly hit. Pop. 12,200.

Cecchi, Antonio (1849-96), b. at Pesaro in Italy. He was a great traveller and explorer, and took part in the Marquis Antinori's expedition to Abyssinia (1876), being responsible for their route from Zeila to Shoa. Two years later he went on an expedition to explore the Galla country, taking with him Chiarini, but they were captured and imprisoned. C. was set free in 1880, his companion having succumbed during the confinement. He was next sent on a mission to Massowah by the It. gov. and succeeded in concluding a treaty of commerce with the sultan of Zanzibar (1885), at the same time pursuing his explorations along the coast. He wrote sev. books of travel.

Cech, Svatopluk (1846-1908), b. at Ostredec, in Bohemia, one of the best-known poets of Bohemia. His poems, inspired by national enthusiasm, have appeared in collections, the first in 1874. The most notable are *Vaclar z Michalovic*, *Lesetinsky Korar* (The Smith of Lesetin), and *Bezne otroka* (The Songs of a Slave). His best-known novels (notable for their satirical wit) are *Povidky*, *Arabsky a Humoresky* (1878-80), and *The Candidate for Immortality* (1884).

Cecidomyia, typical genus of the family of dipterous insects known as Cecidomyiidae, the species of which are charac-

terised by being minute and fragile, with longish antennae furnished with whorls of hair. The larvae are small maggots which live on vegetable or animal substance, and frequently produce galls on plants. *C. destructor*, the Hessian fly of N. America, is well known as a destroyer of wheat; *C. tritici*, the wheat-fly, has a larva which feeds on the pollen of wheat and the ear consequently produces no grain; *C. salicina* is common in France on willows.

Cecil of Chelwood, Edgar Algernon Robert, first Viscount, b. Sept. 14, 1864, long known as Lord Robert Cecil, third son of the third marquess of Salisbury. Educated at Eton, and at Oxford (Univ. College), where he was a prominent speaker at the Union. Called to the Bar in 1887, became K.C. in 1899. Became a prominent member of the Conservative party. He was M.P. for Marylebone, 1906, but resigned his candidature, 1910, on account of his opposition to Tariff Reform. He stood for Blackburn as a Unionist Free Trader, but was defeated. In 1911 (by-election) he was elected as Independent member for the Hitchin div. of Hertfordshire. He held that seat until raised to the peerage. He was an early friend of the women's suffrage movement, and author of the corresponding Bill introduced Oct. 31, which when passed made women eligible to sit in Parliament.

He came into the Coalition Gov., formed during the First World War, in May 1915; being first of all under-secretary for foreign affairs, till 1916; minister of blockade till 1918; assistant secretary of state for foreign affairs, 1918. In 1919 he was in Paris as chairman of the Supreme Economic Council, and assisted in drafting the Covenant of the League of Nations (*q.v.*). In 1920 he attended the first Assembly of the League at Geneva, as representative of the Union of S. Africa. He became Lord Privy Seal in the Conservative Gov. of 1923, and was raised to the peerage in the same year. In the second Baldwin administration, formed Nov. 1924, he was chancellor of the Duchy of Lancaster; and he frequently represented Sir Austen Chamberlain on the Council of the League. He was prin. Brit. representative on the Disarmament Commission at Geneva in 1926-27; and in 1927 he resigned from the gov. to devote himself to the strengthening of the League, in regard to which he had found his colleagues lukewarm. In 1919 he became joint president of the League of Nations Union; and in his book *The Way of Peace* (a collection of essays and addresses) he fully explains the seriousness with which he took the League. His uncompromising attitude towards war is evident from this passage in the introductory chapter: 'There are some who believe that, terrible as has been the material injury, there has been great compensation in the strengthening of the moral fibre of the race. I can see no sufficient evidence to support this belief. On the contrary, morality and religion seem to be weaker than they were, luxury and vice more rampant.'

Awarded the Nobel peace prize for 1937. Other pubs.: *A Great Experiment: an Autobiography* (1941); *A Real Peace* (1941); *All the Way* (autobiography), 1948.

Cecil, Henry, see under EXETER. PEERAGE OF.

Cecil, Lord Hugh Richard Heathcote, first Baron Quickswood of Clothall (b. 1889), fifth son of the third marquess of Salisbury. He was educated at Eton and Univ. College, Oxford. After acting as private secretary to his father, he became a prominent figure in the House of Commons as Conservative member for Greenwich, 1895-1905. He was a supporter of Arthur Balfour's Education Act, 1904, and later one of the leaders of the Unionist Free Traders in opposition to Joseph Chamberlain's policy of Tariff Reform. He was defeated in a three-cornered election for Greenwich, 1906; and was without a seat in the Commons until, in 1910, he was returned unopposed for Oxford Univ. An ardent High Churchman, he supported the Enabling Bill; and, when it became an Act, he was elected a member of the Church Assembly which it set up in 1920. In 1926 he was in favour of a measure that would have facilitated the demolition of old churches in the City of London, defeated in the Commons; and in 1928 he was wholeheartedly in favour of the ill-fated Prayer-Book Measure. He is the author of an admirable book, *Conservatism, 1570-1911* (1912). He has also written *Liberty and Authority* (1910); *Nationalism and Catholicism* (1919); and *Natural Instinct: Basis of Social Institutions* (1923).

Cecil, James Edward Hubert Gascoyne- and Robert Arthur Gascoyne-, see SALISBURY, MARQUESS OF.

Cecil, John (1558-1626), Eng. priest and political agent, b. at Worcester; educated at Oxford, Rheims, and Rome, where he became secretary to Cardinal Allen. He later went to Spain, and was employed by Father Parsons in various treasonable missions between Spain and England. He also acted as a spy for Burghley and Sir Robert Cecil. In 1594 he went to Spain to ask the aid of Philip for the Scottish Catholics, and acted with great success on numerous political-religious missions to France and Rome.

Cecil, Robert, Earl of Salisbury (1563?-1612), statesman, succeeded his father, Lord Burghley, as secretary of state (1598-1608). He was one of the commissioners who tried Essex for leaving Ireland without permission (1600). James I. rewarded C., who had helped him to the crown, by the gift of an earldom, but wanting C.'s estate at Theobalds for himself, obliged him to take Hatfield in exchange. The 'crook-backed' earl, as he was called, was an excellent speaker.

Cecil, Thomas, see under EXETER. PEERAGE OF.

Cecil, William, see BURLEIGH, BARON. Cecilia, saint, in the Catholic Church the patron saint of the blind and of music. Tradition credits her with having been a blind Rom. maiden who was martyred in the time of Alexander Severus (230), but later research corroborates the opinion of

Fortunatus, bishop of Poitiers (d. 600), that she lived in Sicily and was put to death by Marcus Aurelius about A.D. 176. There is a church in the Trastevere in Rome dedicated to her. Her festival falls on Nov. 22, and was always a musical celebration on account of her supposed love of music. Many Eng. poets have composed odes to her, the best known being that of Dryden, set to music by Handel in 1736 and by Sir Hubert Parry in 1889. She has been made famous in literature by Chaucer's *Seconde Nonne's Tale*, and immortalised on canvas by Raphael, Rubens, and Domenichino. Feb. 11 is the festival of another St. Cecilia who suffered martyrdom in Africa under Diocletian (303-4).

Cecropia, genus of tropical Amer. plants of the order Moraceae. The wood is very light, and ignites readily by friction; the fruit resembles a raspberry and has an agreeable flavour; the bark is fibrous. *C. peltata*, the trumpet-tree or snake-wood, is a native of W. Indies and S. America, and the stems are made into trumpets by the Indians. It is noted as an example of myrmecophily in which ants live in the hollow stems, obtain food from the tree, and guard it against the ravages of leaf-cutting ants.

Cecrops, in Gk. mythology the traditional first king of Attica, and, according to Pausanias, the founder of its future political life. He divided the people into twelve communities, and instituted the laws of property and marriage; he abolished the sacrifice of blood, and was the legendary giver of the olive-tree to Attica. His tomb was in the Erechtheum at Athens.

Cedar, or Cedrus, genus of Coniferae which contains three species, *C. Libani*, *C. of Lebanon*, *C. atlantica*, the silver or Mt. Atlas C. of Algeria, and *C. deodara*, the deodar fountain-tree of India. These species, which are probably only varieties of a former plant, agree in having a fragrant, durable, light red wood which is used in building and cabinet-making. They are evergreen shrubs with needle-shaped persistent leaves, have wide-spreading branches, thick trunks, and the seeds take two or three years to ripen. They are cultivated in Britain on account of their handsome appearance, and in India they are thought to be sacred, and are planted near temples. The resin which exudes from the trunks was formerly used in embalming, and an oil was prepared from it. The name of C. is given to about fifty other trees, especially to sev. of the genera *Cedrela*, *Chamaecyparis*, *Cupressus*, *Juniperus*, and *Thuja*. The bastard C. of Jamaica is *Guazuma tomentosa*, and the white-wood C. is *Tecoma Leucocylon*.

Cedarberg, or Cedar Mountains, mt. range in Clanwilliam co. Cape Prov., S. Africa, so called from the profusion with which it is covered by the native cedar (*Widdringtonia juniperoides*). Highest peak, Sneeuwkop, 6300 ft.

Cedar-bird, or *Ampeles carolinensis*, passeriform bird common to N. America, and is closely related to the waxwing.

It is a songless bird, gregarious in habit, swift of flight, and has a voracious appetite, feeding on berries, fruits, and insects. It is known also as the Amer. or Carolina waxwing.

Cedar Creek, riv. of N. Virginia, U.S.A., rising in Shenandoah co., and flowing N.E. to enter the Shenandoah R., 3 m. E. of Strasburg. Near it the Confederates, under Early, were defeated by the Federals, under Sheridan, on Oct. 19, 1864.

manuf. of machinery, carriages, tools, cigars, textiles, etc., and in pork-packing, brewing, and railway industries. It is the seat of the Coe College, founded 1881. Pop. 62,100.

Cedar Resin, name given to the exudation of cedar-trees and allied species of Coniferae. It was at one time employed in embalming.

Cedrela, genus of tropical Meliaceae, many of the species of which yield a



National Building Record

PLASTERWORK CEILING AT TOTNES, DEVON

Cedar Falls, city of Black Hawk co., Iowa, U.S.A., 60 m. N.W. of Cedar Rapids on the Cedar R., and 93 m. N. of Dubuque. It has large manufs. of lumber, furniture, flour, etc., for which water-power is utilised. Pop. 9300.

Cedar Gum, resin obtained from *Callitris arborea* used in medicine and in making varnish. It has a fragrant odour, and in appearance is yellow and transparent.

Cedar Mountains, see CEDARBERG.

Cedar Oil, which is an essential oil frequently used in mounting sections, is obtained from *Juniperus virginiana*. This tree, although known as the N. Amer. red-cedar or pencil-cedar, is not true cedar.

Cedar Rapids, city, Linn co., Iowa, U.S.A., on Cedar R., 63 m. S.W. of Dubuque, and on sev. railways. The water-power of the rapids is utilised in the

compact, scented, and beautifully veined timber. *C. toona*, the bastard cedar, toon, or cedar-wood of S. India, has a bark which is a powerful astringent. *C. australis* is the Australian red cedar, and *C. odorata*, the W. Indian cedar, is made into cigar-boxes.

Cedrine, or Cœrulignone, volatile solid occurring in the form of dark blue needles when in the crystalline condition. It was discovered by Reichenbach, who obtained it from coal-tar products, and its chemical constitution is represented by the formula $C_{15}H_{11}O_2$. It is prepared in the pure condition from the distillation products of beechwood tar.

Cedron (*Simaba* (cedron), small tree of the order Simarubaceae, indigenous to New Granada. Has a fruit like a plum, containing a seed like a large almond. Is a febrifuge and an antidote to snake-bite.

Cedrus, see CEDAR.

Cefalù, seaport of Sicily, standing on the N. coast. at the foot of a mt., 36 m. S.E. of Palermo. It has a fine Norman cathedral, and remains of Norman fortifications, while traces remain of the anct. Gk. tn. of Cephalædium. There are rich marble quarries near. Sardine fishing is an important industry. Pop. 16,000.

Ceglie, tn. of Lecce, Apulia, Italy, 27 m. N. of Brindisi. Pop. 19,000.

Cehegin, tn. of Murcia, Spain. 30 m. N.W. of Lorca. The anct. Legisa. Cereals, wine, hemp, honey, and esparto grass are among its products, and it manufs. paper. There are rich quarries of black marble near. Pop. 15,000.

Ceiling, architectural or building term for the upper interior covering of a room, hall, church, or other building. The derivation has been much disputed. Lat. *celare*, to carve, *celare*, to hide, have been suggested, but the most probable source is Fr. *ciel*, Lat. *cælum*, sky. The term ceiling should not be confused with roof, the C. being 'the undercovering of a roof or floor concealing the timbers' (Murray. *New English Dictionary*); thus such magnificent timber work as may be seen in Westminster Hall or Middle Temple Hall or the stone vaulting of cathedrals, etc., should not be treated as Cs. In the fourteenth century the construction of Cs. proper developed, so that what was merely the underside of the room above became an ornamental feature of the room below. Fr. and It. Cs. of the sixteenth century were moulded in plaster, gilded, and painted. In 1520 Raphael executed for the Vatican a reproduction of a C. from the Golden House of Nero, and the classical mouldings have been a favourite source of decorative design among architects, notably to the brothers Adam at the close of the eighteenth century. In modern times a return to the early timbered Cs., where the constructional beams remain visible, has become popular. The wooden C. of St. Alban's Cathedral is one of the earliest examples of the class in England. Among other fine examples are the It. C. at Holyrood, and those at Haddon Hall; Sizergh Hall, Westmorland; the Red Lodge, Bristol; houses in Fore Street, Totnes, etc. (See illustration. p. 393.)

Celram, see CERAM.

Celakovsky, Franz Ladislav (1799-1852), Bohemian poet and philologist, early became a passionate enthusiast for Slavonic language and literature. His *Slovanské národní písní* (1812-27) was a collection of Slavonic national songs, and he wrote a book on *The Philosophy of the Slavonic Nation in Proverbs*, besides translating a hundred of Russian national songs into the 'kindred Bohemian.' Deprived of his editorship of the leading newspaper of Prague, and of his professorship at the univ. because of his criticism of the severity of Emperor Nicholas in quelling the Polish insurrections, he accepted a professorship at Breslau in 1842, and in 1849 returned to Prague to die, his calamities having embittered and warped his nature. His *Ruze stokrata* (hundred-

leaved rose) is considered his finest poem.

Celandine, name applied to sev. diverse plants. The genus *Bocconia* containing the W. Indian C., and the genus *Chelidonium* containing the common C., are both members of the family Papaveraceæ, while *Ranunculus*, to which the lesser C. belongs, is the typical genus of Ranunculaceæ. *C. majus*, the common or greater C., occurs in Britain; the flowers are small, have four yellow petals, and are in simple umbels. *R. ficaria*, the lesser C., figwort, or pilewort resembles a buttercup, and has nine yellow petals; it was of this plant that Wordsworth sang. The lesser C. is common everywhere amongst grass in spring.



LESSER CELANDINE

Celanese, see under ARTIFICIAL SILK.

Celano, Thomas of (fl. 1250), musical composer, belonged to the order of Minor Friars. He wrote the long thirteenth-century hymn *Dies iræ, dies illa* which is interpolated in the *Requiem* or *Mass for the Dead*. The traditional plainsong setting has been introduced into instrumental music, as for example in Saint-Saens's *Danse Macabre*. He wrote biographies of St. Francis and St. Clara. See also DIES IRAE.

Celastraceæ, order of dicotyledonous plants, containing about forty genera. In tropical and temperate countries. The species are trees or shrubs, with simple, stipulate, often leathery leaves, and small, usually hermaphrodite flowers. The calyx consists of four or five free or united sepals, the corolla of four or five petals, the stamens, four or five in number, and the carpels, two to five in number, are inserted on a flattened disk. There are usually two ovules in each loculus of the ovary, and the seeds have usually a bright aril; the fruit varies. The chief genus is *Euonymus*, the spindle-tree, the wood of which is used for butchers' skewers; the fruits are crimson berries, each containing one to four seeds with an orange-coloured aril. *E. europæus* is common in hedges; other species are cultivated in gardens.

Celaya, city on the Rio Laja, 22 m. W. of Querétaro, in the state of Guanajuato.

Mexico. Its elevation is 6500 ft. and it manufactures woollens, saddlery, etc. Pop. 26,000.

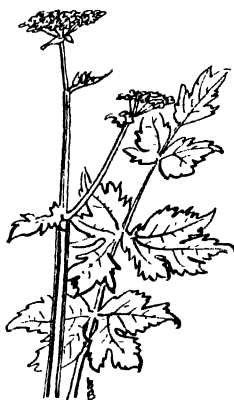
Celbridge, small tn. on the Liffey. 12 m. W. of Dublin in the N.E. of co. Kildare, Eire. Pop. 800.

Celebes, is. of peculiar shape, belonging to the Dutch in the E. Indies. It is situated E. of Borneo and separated from that is. by the strait of Macassar. In shape it is a long narrow strip of land running from N. to S., with three finger-like extensions running E., N.E., and S.E. respectively. Each extension is separated by gulfs named Tomini, Bolo, and Boni. Minahassa, the name given to the N.E. extremity of the N. arm, is of volcanic origin: it is 7500 ft. high, and terminates in Mt. Kema. In the S., in Macassar, the elevation runs up to 10,070 ft. in Bobokaraeng, and to 10,000 ft. in Bonthaeng. One of the characteristics of this is. is the number of lakes, most of them large, and situated at a considerable height above sea-level. Lake Poso, the central lake, is 1640 ft. above sea level, and Lake Tondano in Minahassa 2000 ft. Sadang is the name given to the chief riv., which is in the W. of the is., but it is of very little use for navigation. A N. wind prevails most of the time, and that, together with the sea breezes and rain, tends to temper the great heat, and thus make the climate an exceedingly healthy one. Gold, sulphur, and coal (lignite) are all found in the C. No large carnivorous animals are found here, nor has it the elephant, rhinoceros, or tapir, but the fauna is a specialised one. Reptiles are very numerous. The chief exports are coffee, trepang, nutmegs, copra, copal, and tobacco, and the trade is mainly done from the ports Vlaardingen or Macassar, and Kema in Minahassa. The Dutch built factories on the is. in the latter half of the seventeenth century, and have retained possession ever since. The inhabitants are mostly Malays. Total area 73,000 sq. m. The interior is inhabited by heathen tribes, who worship demons and spirits, cultivate the soil, and rear pigs and buffaloes. The S. and most of the coasts form Muslim principalities. The peninsula, Minahassa, is mainly Christian. The greater part of the is. is practically independent, but the Dutch have concluded treaties with all the native princes. Manado was shelled by Jap. destroyers on Dec. 30, 1941, with slight damage. On Jan. 10, 1942, Jap. forces protected by cruisers landed at Minahassa, despite Dutch resistance. On Jan. 19 Amer. bombers hit the Jap.-occupied airfield at Manado (N. Celebes), shooting down a number of Jap. fighter planes. But by the next day Jap. forces were in command of the whole of Minahassa, and there were further landings at Kendari (S.E. Celebes) on Jan. 24. The Jap. were in possession of the is. until the end of the war in 1945. The pop. is estimated at over 4,200,000.

Celebes Sea, arm of the Pacific Ocean, surrounded by the Sula Is. and Mindanao on the N., Celebes on the S., and Borneo on the W.

Celeriac, see CELERY.

Celery, or *Apium graveolens*, a European species of Umbelliferae found wild in the marshes of England near the sea. In its wild state the plant is poisonous, but when cultivated the blanched leaf-stalks are valuable as purifiers of the blood, and may be eaten raw with cheese and salt, stewed as a vegetable, or made into soup. The form known as celeriac is grown on the Continent on account of the turnip-like flavour of the roots, and it is used chiefly in made dishes or in sauces. In the cultivation of C. the plants are raised from seeds sown in a light, rich, well-drained soil from the end of March to the



CELERY

beginning of May. When they are a few inches high they are transplanted into another bed until they attain a height of 6 or 7 in., upon which a final transplantation is made, and the plants are placed in a row in a trench and gradually earthed up until they receive no light. The soil in this case should be very rich, well fertilised, and well drained, and the goodness of the C. is dependent on its rapid growth and the solid stalk of the leaves.

Céleste, Madame (1815-82), Fr. dancer and actress, b. in Paris. As a child she learnt dancing at the opera ballet, and when only fifteen was offered an engagement in New York, where she made her first appearance at the Bowery Theatre. She then came to England and played Fenella in *Masaniello* at Liverpool and in London, 1831. In 1834 she returned to the U.S.A., where she created a great sensation; according to the story President Jackson introduced her to his Cabinet. She returned to London in 1837, gave up dancing and appeared at Drury Lane. Her best part was Miami in *Green Bushes* by Buckstone. She was manageress of the Adelphi Theatre with B. Webster, and subsequently of the Lyceum. She retired in 1876 and d. in Paris.

Celesti, Andrea (1637-1706), painter of the Venetian school, b. and d. at Venice.

C.'s works are very attractive, especially in colouring, in which he resembles Paul Veronese. He painted landscape, hist., sacred and profane, and *genre*; cabinet pictures, gallery pictures, and altarpieces. Five of his best pictures are in the gallery of Dresden, one of which is the sack of a city by night; it is the largest picture in the collection, being very nearly 23 ft. long by 13 ft. high.

Celestina, La, secondary title popularly given to the *Comedia de Calisto y Melibea*, a Sp. novel of sixteen acts (five more were added later), written in dialogue and usually dated at 1483 or 1497. The author is unknown, though it is highly probable that he was a certain Jew, Fernando de Rojas. Although certain resemblances may be traced between the characters and those in the work of Juan Ruiz, an earlier writer (*q.v.*), it is nevertheless the daring and eminently successful originality that impresses the reader of L. C. Not only does the novel contain types of all contemporary classes, the best drawn of whom are C., Melibea, and Calisto, but it is remarkable also for its intense tragic power. It was soon trans. into Fr., It., Lat., and Eng., by J. Mabbe in 1631.

Celestine is the name of five popes. C. I. (422-32) had a peaceful rule. He was the first to take an active interest in the churches of Britain and Ireland. C. II. (1143-44) removed the interdiction which his predecessor had put upon King Louis VII. of France. The policy of C. III. (1191-98) was marred by hopeless indecision. After he had crowned Henry VI. emperor of Germany, he let him do as he liked, nor had he the courage to use his weapon, the interdiction, against the recalcitrant Prince John of England. Pope C. IV. d. before consecration (1241). The fifth and last pope of the name resigned the chair of St. Peter after five months (1294), and for this great refusal figures in Dante's *Inferno*. He was canonised in 1313. *See also* CELESTINES.

Celestine, or **Celestite**, mineral consisting of strontium sulphate, SrSO_4 . It occurs as large well-developed orthorhombic crystals and as fibrous amorphous masses; it frequently has a light blue colour, whence the name C. The crystals are isomorphous with barytes, but are not so abundant; they possess a hardness of 3, and a sp. gr. of 3.9. Both forms are found in Triassic rocks; near Bristol it has been found that the strontium forming part of the mineral has been taken up by plants; in Gloucestershire the mineral is put to industrial uses. Other localities are Sicily (a colourless variety), Hungary, Jena (fibrous), Strontian Is. in Lake Erie, and Frankstown, Pennsylvania (fibrous). It is also a constituent of some mineral waters. Celestite is used in the manufacture of other compounds of strontium, such as the hydrate, which is employed in the refining of beet-sugar, and the nitrate, which produces the 'red fire' used in theatres and pyrotechnic displays.

Celestines were a religious order founded about 1256 by Peter di Morrone, afterwards Pope Celestine V. Though the C.

are counted a branch of the Benedictines, their form of gov. was much more akin to that of such mendicant orders as the Franciscans. Peter tried with ill success to persuade both the Benedictine monks of Monte Cassino and the Franciscan spirituals to coalesce with his brotherhood. At one time there were many Celestine monasteries in Italy, France, and the Netherlands, but the order is now practically extinct.

Celeus, king of Eleusis in Attica, extended a friendly hospitality to Demeter, when she was seeking for her daughter Persephone. Demeter found solace in nursing Demophoon, C.'s son, but was prevented by the child's mother from making him immortal by holding him over the fire.

Celibacy, term now generally used in the sense of a state of complete abstinence from marriage (Lat. *caelebs*, unmarried), but formerly including the state of a widow or widower. Considered generally, medical opinion holds that the chances of life are greater for married than for single persons, and, from the point of view of the interests of the State, it is obvious that widespread habits of permanent C., or of delay in marriage to a late period of life, must be disastrous. It is thus that C. has been frequently discouraged by legislation. In A.D. 9 (*Lex Julia et Papia Poppæa*) the Emperor Augustus decreed that celibates could not inherit unless related to the deceased in the sixth degree, limitations were placed on inheritances from husband to wife, and vice versa, if the union was childless, and preference was also given to candidates for office according to the number of their children. Taxation of bachelors has at times been enforced and still more often proposed. It is, however the enforcement of C. upon the clergy, or upon the adherents of particular religions, or upon special classes of those adherents, that makes C. of particular historic interest. To trace that hist. throughout the ages would be to write the hist. of asceticism: it must suffice to call attention to the self-mutilated priests of Cybele, the Galli, to the Rom. vestal virgins, and to the C. of the ant. Buddhist monasteries, and to confine this article to the C. of the secular clergy in the Christian Church. The C. of the monastic orders is a matter of vow on entering the order. Heb. religion made the priesthood hereditary from father to son, and the C. of the Essenes sect was a foreign idea due to contact with Hellenism and the E. mystics. St. Paul, speaking on the subject, asserts that a missionary can work more freely without the burden of a wife and children, but reserves for the apostles the right to take a wife with them in their journeys. It has been freely admitted since the Renaissance by the learned churchmen that C. was no rule of the apostolic church, and that view has not been rejected by the latest Catholic authority. Clerical C. grew slowly; its hist. can be traced first merely as a custom rather than as a discipline. The first clear rules come from the fourth century, where bishops and priests were

not allowed to marry, but might retain their wives if married before ordination. The lesser orders, deacons, etc., might marry only one wife, who must not be a widow or have been a concubine. Gradually, as the clergy became administrators of rich endowments, the feeling grew stronger that church revenues must be kept for the church and not be used to support the families of priests, and more stringent rules were put in force. The synod of Elvira, a local Sp. synod, A.D. 305, was the first to place the ban on the marriage of the higher clergy; at the council of Nicæa, 325, a law to enforce C. on all the clergy was rejected. Paphnutius, a bishop of Egypt, warned the council against imposing so heavy a yoke, and defended the sanctity of marriage. The decretal of Pope Siricius, 385, commanded C. on bishops, priests, and deacons, and the separation from their wives on those already married. Popes Leo (461) and Gregory the Great (604) extended the rule to subdeacons. The struggle for the enforcement of C. continued; it was constantly resisted and frequently openly and freely disobeyed. Marriage of priests was still recognised sporadically, and where this was not the case, the practice of having concubines, *subintroductæ*, was often followed. Pope Gregory VII., Hildebrand, 1073, took such strong measures that he is often regarded as the author of the rule. Marriages of priests were declared null and void, the wives were treated as concubines, and heavy punishments inflicted on them; no priest who broke the rule could perform the Mass, and the lay people were warned against going to such priests. That the rule was not submitted to without a long struggle is shown by the fact that in 1450 John de la Bere, bishop of St. David's, refused to enforce the rule among his clergy, as he derived 400 marks yearly from their women. It was a subject of violent dispute at the Reformation, and finally was one of the most marked lines of difference between the Rom. and the Protestant Churches. At the revolution in France, by the constitution of 1791, all restrictions on the marriage of priests were abolished, but few priests took advantage of it. It remains to add that in the Orthodox (Gk.) Church priests usually marry before taking priest's orders, but may not re-marry; bishops must not continue their married life, but are usually monks.

Cellje, see CILLI.

Cell, in biology, the living unit of which all living forms are composed, according to the generalisation first propounded by Schleiden and Schwann (1838). The study of cells is *cytology*. The plant C. consists of a microscopical mass of protoplasm usually enclosed within a wall of a carbohydrate called cellulose. The animal C. usually possesses no obvious boundary wall, and is capable of changing its shape in many ways. Some animals and plants consist of one C. only; such are the Protozoa among animals and the bacteria among plants. Most living forms are multicellular, but the hist. of every

organism can be traced back to a single C., namely the fertilised egg. A single C. is the unit of structure of every living organism, and is capable of assimilating food material and growing, of changing its structure to adapt itself to particular conditions, and of reproducing other Cs. with which it may or may not retain some connection. Thus every C. owes its origin to some pre-existent C. It develops, fulfils its functions, and is at length destroyed or divides into other Cs. Knowledge of the structure and composition of the living C. is too inadequate to estab. any theory of the chemical and physical conditions which may have brought the original C. into existence.

Structure.—All Cs. consist of protoplasm. This term was first applied by von Mohl (1846) to the C. substance of plants, and subsequently included the similar substance previously observed in animal Cs. Protoplasm is a very complex mixture, consisting of organic compounds of the elements carbon, hydrogen, oxygen, nitrogen, phosphorus, sulphur, calcium, iron, sodium, magnesium, and potassium.

Owing to its colloidal nature, protoplasm is semipermeable, and this property enables liquid food to enter a C. and to be retained by it. The recognition of the colloidal nature of protoplasm is comparatively recent, and the different views held by various workers with regard to the structure of protoplasm are probably due to the different aspects presented by different phases of a colloidal system.

The protoplasm of most Cs. is differentiated into a colourless, translucent, viscous fluid, the *cytoplasm*, in which is embedded a more granular body, the *nucleus*. Included within the cytoplasm may be particles of food reserve and waste products; such inclusions are termed *metaplasm*. The cytoplasm may also contain bodies known as *mitochondria*, which are possibly of importance in respiration, and a *Golgi apparatus*, thought to be concerned in secretory activities of the C. The outermost boundary of the cytoplasm of some animal Cs. may be modified to form a membrane. The C. wall, when present, is not part of the C. proper; it is regarded as an enclosure probably secreted, or even excreted, by the cytoplasm. During the growth of the C., spaces termed vacuoles may form within the cytoplasm, and are filled with fluid, the C. sap. They occur more commonly in the Cs. of animals than of plants. Some Protozoa have contractile vacuoles which were formerly thought to excrete waste substances, but are probably more important for pumping out water.

The nucleus has a definite membrane enclosing a colourless fluid, the *karyolymph*, or nuclear sap, embedded in which is a delicate network, the *reticulum*, of *linin*. Distributed on this are granules of *chromatin*, so called because of its great capacity for absorbing certain stains. The chromatin is frequently irregularly distributed, forming small accumulations, *karyosomes*, on the reticulum. Within the nucleus there are often one or more

masses of chromatin; each of these is a *nucleolus*. It may function as a reserve supply of chromatin or may be extruded during nuclear div. as a waste product when supplies are plentiful. The nucleus is also believed to contain *chromosomes*, though these can only be demonstrated at the time of C. div., as described below.

The nucleus plays a very important role in the life of the C. Deprived of its nucleus, a C. may live for a few days, but death eventually occurs. In some way the nucleus controls the metabolism and distribution of food, initiates C. division, and is intimately connected with heredity. The mature red blood Cs. (corpuscles) of mammals are peculiar in lacking a nucleus, but in their early stages of development they are nucleate; the red corpuscles of other vertebrates contain a nucleus.

A small granule, the *centrosome*, is found in the Cs. of animals and of some plants. It usually lies in a clear area near, or even within, the nucleus; sometimes two centrosomes are present. They take an important part in the div. of animal Cs. and of some plant Cs.

Differentiation.—Cs. possess the power of developing certain qualities which enable them to perform their duties in the whole organism. Some single-celled organisms are capable of changing their shape, and thus accomplishing some extent of movement. The *ameba*, for instance, can advance upon its food, envelop it, and incorporate it into its own substance, performing all the functions of movement, growth, digestion, excretion, and reproduction by itself, and on this account it is now often described as non-cellular, rather than unicellular, since it corresponds to the complete body of a higher organism rather than to one C. of that body. Except in the lowest multi-cellular organisms, it is necessary that there should be some div. of labour, that is, that the Cs. should become different from one another in function. Different degrees of differentiation occur; some Cs. become closely adherent to each other, forming the different kinds of epithelial tissues, some become altered in shape to form muscular or nerve fibres, and so on. Certain of the epithelial Cs. develop *cilia* or numbers of soft filamentous projections which are continually lashing to and fro. By this action, the mucus of the windpipe and air passages is gradually worked to the throat and then down towards the stomach, carrying with it the dust which might otherwise injure the lung. Certain Cs. specialise, as it were, in secretory function, as the mucus-secreting epithelial Cs., the fat Cs., and those which develop into ova. Others, as the nerve Cs. and nerve fibres, take for their special function the reception or communication of stimuli. Nerve Cs. are masses of protoplasm from which certain processes radiate, the long processes being nerve fibres. The actual mechanism or chemical action by which stimuli are transferred from one nerve C. to another is not known.

Reproduction.—Cs. may reproduce by

direct div., *amitosis*, or indirect div., *mitosis* (formerly known as *karyokinesis*). In the direct form of div. the Cs. are medially constricted and ultimately separate. The indirect form is a more complex process. The centrosome and the area in which it lies—the attraction sphere—divide into two parts which travel to opposite parts of the nucleus. The nuclear reticulum and membrane disappear, and the chromosomes become visible; each is already split longitudinally into two halves (*chromatids*). The daughter centrosomes, if present, subsequently separate from each other and travel to opposite poles of the nucleus and a spindle of fine fibres spreads between them. The chromosomes arrange themselves on the spindle, and generally half of each chromosome passes to each pole. The chromosomes are constant in number for each species, e.g. the sweet pea has seven pairs; *Drosophila*, the fruit fly, has four pairs. Frequently the chromosomes have definite shapes which appear in every div. The germ Cs. of animals contain only one chromosome of each pair, so that when fertilisation occurs the double number will be restored. These Cs. are consequently said to be formed by a reducing or meiotic div., in which the whole chromosomes of each pair pass to opposite poles. By this means the number of chromosomes is prevented from being doubled in every successive generation. The reducing also occurs once in the normal life hist. of a plant, but at various phases of the life hist., according to the type of plant. In all higher plants the reduction is at the time of spore formation.

The constancy of number and form of the chromosomes suggests that they would provide a suitable mechanism for inheritance, and genetic evidence supports the view that the nucleus plays a very important part in the transmission of characters. Breeding experiments with *Drosophila*, for instance, show that the hereditary characters are linked in four groups, which is in accordance with the chromosome number of four pairs. Indeed the relationship of genetics to cytology is so close as to constitute the composite subject *cyto-genetics*. See L. Doncaster, *An Introduction to the Study of Cytology*, 1924; C. D. Darlington, *Recent Advances in Cytology*, 1936; C. H. Waddington, *An Introduction to Modern Genetics*, 1939; R. A. R. Gresson, *Essentials of General Cytology*, 1948.

Cell, Voltaic, apparatus for generating electricity by chemical action. Prior to the experiments of the It. physicist Volta, electricity was known only in a *static* form; that is, charges might be stored in Leyden jars or other condensers, and could be utilised to obtain an instantaneous effect. Volta showed that by placing two dissimilar metals in contact, a mild but continuous disengagement of electricity occurs; he attributed the generation of the electricity to the mere contact of the two metals, but subsequent inquirers maintained that chemical action was promoted by the perspiration of the hand. It has since been demonstrated

that most chemical actions are accompanied by electrical disturbances, and whether such effects as Volta exhibited are altogether due to chemical action is mainly a matter of definition. Of all chemical actions, the most productive of electricity are those occurring between liquids and metals. In general it may be said that when a liquid acts upon a metal, the liquid becomes positively charged and the metal negatively charged. A simple form of C. may be arranged by partially immersing a plate of zinc and a plate of copper in dilute sulphuric acid. Very little chemical action is at first apparent except slow generation of hydrogen at the zinc plate. If, however, the plates are connected by a strip of metal laid across the top, a brisk chemical action is set up, but the hydrogen comes off at the copper plate; and if convenient arrangements are made, the passage of a current of electricity through the connecting strip or wire can be demonstrated. What happens is that negative electricity is produced in the zinc, and positive electricity flows through the wire from the copper to produce equilibrium; but as the chemical action is continuous, so is there always a difference of potential between the two plates, and thus a continuous 'current' is produced. The negative plate is always that which is the more powerfully affected chemically by the liquid; thus copper is positive in a couple consisting of zinc and copper, but negative in a couple consisting of copper and carbon. Such a C. as has been described has many disadvantages. First, the acid gradually weakens owing to the constant formation of zinc sulphate, and therefore the action becomes feeble. Secondly, zinc is often impure, and local chemical actions are set up by reason of the impurities; other small currents are produced, with a disturbing effect on the main current. In the third place, the hydrogen adheres to the copper plate and not only prevents the perfect contact of metal and liquid, but also reacts with the dissolved zinc sulphate, and tends to deposit a layer of zinc upon the copper, when there would result, not two dissimilar, but two similar, plates of metal. The last effect is called polarisation, and may be rectified by exposing the copper plate to the air, or by sending a current from another battery through in the reverse direction, or by simple mechanical brushing. V. Cs. have another disadvantage where any great quantity of current is required; the cost of material effectively prevents their competing with the more economical dynamo system. Still, there are light services where they are found convenient, such as the ringing of bells, experiments in the laboratory, lighting of moderate power (as in electric torches and the like), etc. They are then either used singly, when the wire from the more active plate becomes the negative terminal, and that from the less active the positive terminal, or in batteries, where all the negative poles may be linked together into one, and the positive poles similarly arranged, or the negative pole of one joined to the positive

pole of the next, and so on, the free wires acting as the terminals. The following are the best-known Cs., though some of them are now of little more than antiquarian interest:

Daniell's Cell.—A glass vessel contains a solution of copper sulphate, kept saturated by crystals placed on an annular shelf below the surface of the solution. A perforated copper cylinder stands in the solution, and within this a thin porous cylinder of unglazed earthenware; this contains dilute sulphuric acid, in which is placed a cylinder of zinc. The hydrogen produced by the action of the acid on the zinc is not deposited on the copper, but combines with the copper sulphate in the outer cylinder; the sulphate is thus constantly being used up, hence the necessity for extra crystals. A Daniell's C. has an E.M.F. of about 1.08, and remains constant for some hours.

Grove's Cell.—This differs from a Daniell's C. in containing nitric acid instead of copper sulphate, and platinum instead of copper. It consists of a flat rectangular vessel, partly filled with sulphuric acid, a U-shaped zinc plate, a porous pot containing strong nitric acid and a thin platinum foil. The disengaged hydrogen in this C. decomposes the nitric acid, giving off nitrous fumes. A Grove's C. has an E.M.F. of about 1.96.

Bunsen's Cell.—This resembles a Grove's C. in principle, the expensive platinum foil being replaced by a rod of gas-carbon. The C. consists of a glass vessel containing dilute sulphuric acid; within is a cylinder of amalgamated zinc; within that a porous vessel containing nitric acid and a rod of carbon. When arranged in battery, clamps have to be used to engage the carbon rods to the succeeding zinc cylinders. Such batteries were formerly much used on the Continent for experimental work. E.M.F. 1.91.

Smee's Cell.—This is a one-fluid C. in which polarisation is prevented by mechanical means. The C. consists of a sheet of platinum or platinised silver, placed between two plates of zinc, the whole being immersed in dilute sulphuric acid. The platinum is covered with finely divided platinum, from which the hydrogen rises more readily than from a smooth surface.

Bichromate Cell.—This consists of a zinc plate which slides up and down between two carbon plates dripping into a mixture of potassium bichromate and sulphuric acid, or chromic acid and sulphuric acid. This solution rapidly acts on the zinc, so that the zinc plate is clamped above the surface of the liquid when the C. is not in use. The E.M.F. is about two volts, but falls off after a while; for short experiments where a moderately high power is required these Cs. are very useful.

Lerlanché Cell.—This consists of a glass vessel about one-third full of a strong solution of sal ammoniac. The positive plate is a rod of zinc placed in this liquid; the negative plate is a rod of carbon placed in a porous pot which is tightly packed with manganese dioxide mixed with

carbon. The porous pot is sealed with pitch, only the top of the carbon rod projecting, and occupies the middle of the glass vessel containing the sal-ammoniac solution. The C. quickly becomes polarised, but with rest recovers of itself, and it is therefore well adapted for such intermittent service as the ringing of bells, etc.

Dry Cells are usually Cs. of the Leclanché type, in which the liquid sal-ammoniac is replaced by a paste or jelly consisting of sal-ammoniac and some absorbent material. They are very convenient and portable, and are well adapted for electric pocket lamps carried about on the person.

Latimer Clark's Cell.—One form of this C. consists of two glass tubes joining to form a common trunk; the bottom ends are closed with a platinum wire sealed in each, and the common neck is closed with a ground-glass stopper carrying a thermometer. In one branch is mercury covered by a paste formed by mixing mercurous sulphate, mercury, and zinc sulphate, and in the other is an amalgam of zinc and mercury. Crystals of zinc sulphate are placed in both bulbs, and the whole vessel is filled with zinc sulphate solution. The C. is not economical as regards voltage, but it is remarkably constant in E.M.F., and is therefore used as a standard C., having superseded the Daniell's C. for that purpose.

Minotto's Cell consists of an earthenware vessel at the bottom of which is a layer of powdered copper sulphate supporting a copper disk provided with a copper wire. Upon the disk is a layer of sawdust, on which rests a zinc cylinder; the whole is filled with water, from which, however, the wire from the copper disk is insulated. The C. is therefore a modification of a Daniell's C., the porous cylinder being dispensed with.

De la Rue and Müller's Cell consists of a glass tube 6 in. long, containing half an ounce of silver chloride, the remainder of the C. being filled with sal-ammoniac solution. The tube is closed with a vulcanite stopper through which a zinc rod 5 in. long and a silver wire 6 in. long pass. The hydrogen generated reduces the chloride to silver, which is deposited on the silver wire. E.M.F. about 1.03 volt. The advantage of the C. is its compactness. See also ACCUMULATORS.

Cellaria, genus of polyzoans in the group Flustrina, which is typified by the genus *Flustra*. In appearance it resembles a seaweed, and it is common on Brit. coasts.

Cellarius, Christopher (1638–1707) (whose real surname was Keller), Ger. classical scholar, was a student at the univ. of Jena and Gleesen. He had taught in four gymnasia, including that of Weimar, before he became prof. of hist. at the univ. of Halle in 1693. His many text-books, as, for example, his *Latin Grammar*, *Antibarbarus Latinus* (1677), and *Latin Orthography* (1700) did much to raise the fallen prestige of classical studies. Other of his manuals were among the first authorities on the Samaritan language.

Celle, tn. in the prov. of Hanover, Germany, 23 m. N.E. of Hanover, on the Lehrte–Hamburg railway. The tn. was founded in 1292, and from the fourteenth century until 1705 was the residence of the dukes of Lüneburg-C., a branch of the house of Brunswick. The former ducal palace, which includes the court of appeal (*Oberlandesgericht*), containing a fine library, is a Late Gothic building, commenced in 1485, but considerably added to at the end of the seventeenth century. The tn. church contains the ducal burial vaults, and Sophia Dorothea, the divorced wife of George I. of England, is buried there, also Caroline Matilda, the divorced wife of Christian VII. of Denmark. Woollen yarn, tobacco, biscuits, umbrellas, etc., were the manufs. before 1939. Near by is Belsen, notorious for the concentration camp under the management of Kramer and his fellow criminals. See under REISEN. Pop. 25,550.

Cellier, Alfred (1844–91), Eng. musical composer. In company with Arthur Sullivan he was a chorister at the Chapel Royal, St. James. In 1862 he became organist at All Saints Church, Blackheath. He then went to Belfast as director of the Ulster Hall concerts and conductor of the Philharmonic Society. Returning to London, he was appointed organist at St. Albans, Holborn, but in 1871 he went to Manchester to conduct at the Prince's Theatre. For the next eight years he conducted at Manchester and at London theatres, at the same time composing operas and operettas; of his earlier works *The Sultan of Mocha* was the most successful, but he achieved his greatest success in 1886 in *Dorothy*, a comic opera, the libretto being written by B. C. Stephenson. He owed a good deal to his friendship with Sir Arthur Sullivan, but his writing is remarkable for its delicacy and pleasing melody. He composed settings of Gray's *Elegy* (for orchestra and chorus). *The Mountebanks*, libretto by W. S. Gilbert, was produced after his death in 1892.

Cellini, Benvenuto (1500–71), It. artist, fortunately wrote his own life. It reads like the most extravagant of adventure tales. B. in Florence, he was expelled from his native city because of his implication in some civil broil. After living in Bologna, where he became an excellent flautist, he eventually arrived in Rome. Here he became court musician to Pope Clement VII., made silver vessels of every description, and finally in 1527, according to his own account, actually killed with his own hand the Constable de Bourbon, who was attacking Rome, and later mortally wounded the prince of Orange. A little while after he had been pardoned for slaying his brother's murderer, he killed by accident a rival goldsmith. But Paul III. set him free in 1534, as he wanted some dies in the mint engraved. Later, being falsely accused of embezzling pontifical jewels, he was thrown into an oubliette of St. Angelo. The intercession of Cardinal d'Este alone saved him from death. His sojourn at

the court of Francis I. was cut short by his murderous attack on the plaintiff in a lawsuit. Finally C. returned to Florence, where he executed his famous bronze 'Perseus with the Head of Medusa' (in the Loggia dei Lanzi, Florence), under the patronage of Cosmo de' Medici. The merits of this masterpiece are such as to make it one of the most typical and unforgettable monuments of the Italian Renaissance. Of his many other works of art there have survived to this day the famous silver salt-cellar of Francis I. (now at Vienna), a medallion of his patron, Clement VII., and some gold medals. As an artist he has perhaps been overrated, for his knowledge of anatomy was small and his designs often weak.



BENVENUTO CELLINI

But his versatile genius, which made him at once a goldsmith, sculptor, and engraver, led him also to write, and to-day his fame largely rests on his unique and diverting autobiography. J. A. Symonds, who trans. it into Eng., says that from its pages 'the Genius of the Renaissance, incarnate in a single personality, leans forth and speaks to us.' Here the author narrates with a frankness that disarms the moralist the whole story of his amours, his passionate devotion to arts, his shameless self-worship, and self-assertion running into almost incredible extravagances, the devout complacency with which he could contemplate a well-achieved homicide, and his alleged supernatural visions and angelic protection during adversity. See trans. by T. Nugent, 1771, 1812; J. A. Symonds, 1888; T. Roscoe, 1822, 1904; A. Macdonell (Everyman's Library), 1903; R. H. Cust, 1910; also life by R. H. Cust, 1912.

Cellular or Areolar Tissue. loose connective tissue consisting of fibres running in all directions and forming meshes called areolae. There are two

kinds of fibres: white fibres, which are soluble in boiling water to form a solution of gelatin, and yellow elastic fibres, insoluble in hot water. In the spaces of this tissue are found lamellar cells, flattened cells usually attached to bundles of white fibres; plasma cells, not flattened; granular cells, packed with deeply staining granules; and leucocytes which have left the blood capillaries. It is the commonest connective tissue in the body, being found in the skin and also covering all the internal organs.

Cellulitis, diffuse inflammation of cellular tissue, caused by septic invasion. The tissue may regain its healthy condition if treated by rest and hot fomentations, but suppuration may occur which may endanger neighbouring structures. An important variety is pelvic C. or parametritis, in which there is inflammation of the cellular tissue about the uterus. This condition may be consequent upon abortion or delivery following operations. It may be anterior, when, if the inflammation proceeds to an abscess, the pus is discharged into the bladder, vagina, or groin. Inflammation of the posterior tissues may cause fixation and torsion of the uterus. Remote parametritis is characterised by abscesses appearing some distance from the seat of the disease. Pain should be treated by anodynes, and an effort should be made to reduce the inflammation by careful diet and hot counter-irritants. When an abscess is formed, it should be localised if possible, an incision made, and the pus drained off. Sulphonamides and penicillin are of great value in the treatment of C. After-treatment include a prolonged period of rest.

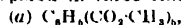
Celluloid, Xylonite, or Pyroxylin Plastico, artificial colloid prepared from a mixture of nitrocellulose with camphor. It was first prepared by Parkes and Spill in England, in 1856, but the improvements in the manuf. introduced by Hyatt, of Newark, New Jersey, revolutionised the industry and made it predominantly Amer. The name Xylonite is given to it by the leading Brit. manufs. the Brit. Xylonite Company. The nitrocellulose is first made from substances composed essentially of cellulose, such as rags or, more particularly, tissue-paper. Shreds or strips of the latter are steeped in a combined bath of sulphuric and nitric acids of such composition as not to produce the explosive gun-cotton. Nitrocellulose is thus produced, and great pains are taken to extract the excess of acid, the presence of which produces deterioration in the final product. This is done by thorough washings and the water is either pressed out by hydraulic pressure or replaced by alcohol. Drying by heating would be too dangerous owing to the risk of explosion. The next process is to break up the cakes of nitrocellulose and add to it camphor dissolved in ethyl alcohol in the proportion of two c nitrocellulose or pyroxylin to one of camphor, and mix the whole thoroughly up in a kneader. In some cases flake camphor is added to

the pyroxylin and the mixture in boxes sprinkled with alcohol until it settles down into a dough. At the same time colouring substances and a fixing compound are added, and the whole is made homogeneous. It is then rolled and worked in heated rollers and pressed by hydraulic pressure machines, and a cake produced of the material containing a quantity of the liquid solvent, which must be removed by keeping the substance in a heated room for prolonged periods. When all is removed shrinking has occurred, and the substance is ready for working in various processes. C. is buff in colour, but may be bleached by means of bleaching powder or other bleaching agent, and can also be made transparent in various colours. It is coloured by mineral colours, while coal-tar dyes are employed for colouring the transparent varieties. In the latter there is more need of a stabiliser or fixing compound than in the other varieties, since the generation of acid is more liable to cause deterioration. A substance is required that reacts with this acid to give products of reaction that will be harmless to the material, and it is found that compounds of urea serve this purpose very well. C. brought in contact with a flame burns more rapidly than paper, camphor distils off, and a good deal of free carbon is evolved. There is always a slight odour of camphor about it, except in the very best produced, especially when it is scratched. Non-inflammable C. has not yet been developed with sufficient success to become a commercial product. It is non-explosive at ordinary working temps. and is plastic at 75° C. Its hardness and elasticity at ordinary temps., together with its invulnerability, have led to its wide application in articles of daily use. Thus, for knife handles, piano keys, combs, and mirror backs its use is general, and its ease in working up has led to the imitation of such natural products as ivory, horn, and bone. Imitation marble is made by pressing together plates of differently coloured material, while imitation tortoise-shell can be and is much produced by pressure and heat on yellow plates between yellow coloured with brown. In recent years, C. has been largely displaced by such modern plastics as bakelite, nylon, perspex, etc.

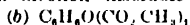
Cellulose, organic substance secreted by the protoplasm to form the primary cell-wall of all plants, but it is not essentially present in all successive layers of the cell-wall after thickening has taken place. It is a carbohydrate, and its chemical composition is formulated as $C_6H_{10}O_5$; its characteristic reaction is that it turns blue when treated with sulphuric acid and iodine. C. is remarkable for its insolubility, and only an ammoniacal solution of oxide of copper will dissolve it without change. When soaked in strong nitric and sulphuric acid gun-cotton is obtained from it; when boiled for a long time with dilute hydrochloric or sulphuric acid it is converted into glucose. It is well known to us in a very pure state as cotton-pith, vegetable ivory,

and parchment-paper. As it occurs so freely in vegetable matter it naturally enters into our diet to some extent, but in man it is not nearly so easy of digestion as it is in ruminating animals.

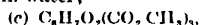
Cellulose Acetate is a substance formed by treating purified cellulose, in the form of cotton or bleached cotton linters, with acetic anhydride in the presence of sulphuric acid. It is a pale yellowish, transparent, non-inflammable mass and can be prepared in three chief forms



soluble in alcohol, insoluble in water;



insoluble in water;



insoluble in water, alcohol, and ether.

The first manufacturing process for C. A. was patented in 1894 by C. F. Cross. Miles in 1905 improved the quality of the product by introducing the process known as ripening, while the research work of the brothers Dreyfus during and since the First World War has resulted in the development of the acetate-silk industry. (See ARTIFICIAL SILK.) The C. A. as prepared on the commercial scale is a mixture of sev. acetate compounds. It is precipitated with water in the form of flocks, washed free from acid, dried and dissolved in acetone. The resulting clear viscous solution is filtered and delivered to spinning machines. Amongst its other uses are aeroplane dope, non-inflammable films, lacquers, and non-shatterable glass.

Celosia, tropical and temperate genus of Amarantaceae, cultivated in England on account of the curious inflorescence, which is crested and flattened, and gives the plants the popular name of cockscomb. This appearance is due to the monstrous condition of the floral axis which has now become a common characteristic of the plants through cultivation. *C. cristata*, the common cockscomb, and *C. coccinea*, both natives of the E. Indies, vary in height from 6 in. to 2 ft. and the colours from red to white.

Celsia, genus of Scrophulariaceae, known to Asia, Africa, and the Mediterranean. The flowers are nearly regular, and there are only four stamens. *C. orientalis* and *C. sublanata* are the most noteworthy species.

Celsius, Anders (1701-44), Swedish astronomer, b. at Upsala. He was prof. of astronomy in the univ. in his native tn. from 1730 to 1744. He travelled much in Germany, Italy, and France. In 1733 while in Nuremberg he pub. numerous observations of the aurora borealis which he had made himself. He invented the centigrade thermometer.

Celsius, Magnus (1621-79), Swedish astronomer, b. at Alfta, Helsingland. He was a prof. of mathematics and astronomy at Upsala, where he discovered the Helsing runes and deciphered them. He d. at Upsala.

Celsius, Olof (1670-1756), son of Magnus C., b. at Upsala. He held the post of prof. of theology and oriental languages

at the Upsala Univ., and was also a provost of the cathedral. He was a great botanist, and made himself famous by his researches on the plants mentioned in the Bible. He was the patron and instructor of Linnaeus.

Celsius, Olof, the Younger (1716-94), Swedish historian and poet, son of Olof C. b. at Upsala. For some years he held the appointment of assistant librarian at the Upsala Univ., where he became prof. of hist. in 1747. Later he entered the Church and went to Stockholm, and in 1777 he was made bishop of Lund. He was one of the original members of the Swedish Academy. He wrote, among other works, a hist. of Gustavus I. (1746-1753), and a hist. of Eric XIV. (1774), and was famous for his brilliant style and keen criticism. He d. at Lund.

Celsus (c. A.D. 178), one of the earliest opponents of Christianity, lived during the reigns of the Antonines, and is believed to have been a friend of Lucian. He was the author of *The True Word* (Ἀληθὴς Λόγος) which was being preserved for us in fragments by Origen, who undertook to refute C.'s arguments, and did so in his work, *Contra Celsum*. The heathen's attitude may be somewhat Platonic, with a tendency towards Epicureanism, but essentially it is that of the man of the world whose religion is mere agnosticism, and who has brilliance without depth. He upbraids the Christians for their absurd credulity, their party schisms, their exorcism of demons, and for the disreputable character of their proselytes, who are rogues, poisoners, thieves, and idlers, women and slaves.

Celsus, Aulus, or Aurelius, Cornelius, Latin writer on medicine and surgery. Little or nothing is known of his life, but he probably lived in the reigns of Augustus and Tiberius. He wrote sev. works, of which only one remains entire, his treatise *De Medicina* in eight books. Books i. and ii. deal principally with diet and principles of therapeutics and pathology; iii. and iv. with internal diseases; v. and vi. with external diseases and pharmaceutical preparations; and vii. and viii. with diseases calling for surgical treatment. His method in dealing with disease is apparently to allow nature to take its own course, though he also advises a free use of the knife on occasions. His treatise on surgery points to the fact that many of the most delicate and serious operations were performed in his time. It is not clear whether C. wrote a separate treatise on surgery apart from what is contained in books vii. and viii. of his *De Medicina* or whether he also wrote a separate work on pharmacy. According to Seyffert, C. was the author of an encyclopedic work called *Artes* in more than twenty books, of which all that remain are books 7-13 (sic) *De Medicina*.

Celsus, P. Juventius, Rom. jurist, son of a jurist, Juventius C. (fl. c. A.D. 75); b. c. 67, d. c. 135 or about the year when Hadrian d. Was accomplice in a conspiracy against Domitian along with

Nerva and others, but contrived to exculpate himself and his companions. Subsequently he was highly favoured by Nerva and his son, Trajan. He was praetor at some time and twice consul, but the date of the first is not recorded, though the second is said to have been A.D. 129. He was a friend of Hadrian. He received legal instruction from his father and early began the practice of law. Only fragments of his legal commentaries are extant. Among these are a digest of thirty-nine books, seven of which are a commentary on the *Lex Julia et Papia Poppaea* (prohibiting the marriage of senators and freedwomen and all free-born with actresses or women of openly bad character) an attempt (with other *leges* of a similar kind) to restore virtue to private life by a system of rewards and penalties. In these fragments there are sev. passages which betoken great self-confidence and dogmatism; for where most jurists prefix their opinions with a *videtur* (or as we should say, 'it is submitted that etc.') C. stated his opinions unreservedly. But that he was an eminent jurist is shown by the fact that he is so often quoted by many of the most famous jurists of a later time—Pomponius, Ulpian, Paulus, and Maccianus.

Celt (from Low Lat. *cellis*, a chisel), has been used by both Eng. and Fr. archaeologists to designate the stone and bronze axe-heads used by the primitive peoples of Europe. The normal length of a stone C. is 7 in., but it varies from 1 to 20 in.; a bronze C. may be 10 in. long, but is usually 5 or 6. The earliest stone Cs. were made of schist, slate, or shale, but the latter were of porphyry, flint, or agate, stones which allowed of a high polish and a fine cutting edge. Most stone Cs. and some bronze ones are flat blades of oval section, sharpened more at one end than at the other. The better bronze axe-heads often had flanged edges, a stone ridge or elevation, between the blade and the part to which the handle was fitted, and a socket or hollow for the handle. Cs. served as axes, chisels, adzes, etc., and were superstitiously regarded as 'thunderbolts,' or as implements endowed with strange curative powers.

Celtiberi, powerful people of ant. Spain, said to have sprung from the intermarriage of Sp. aborigines (Iberians) and Celtic invaders from Gaul. They inhabited an inland dist. (approximately the present S.W. of Aragon and N. and E. of Castile). Celtiberia, however, was often used to include country right to the Guadalquivir's sources. The C. were one of the bravest and noblest peoples of the peninsula. Subdued by Hannibal, they served as Carthaginian mercenaries against Rome, later becoming Rom. mercenaries (Liv. xlv. 49). T. Sempronius Gracchus subdued their country, 179 B.C., but they were always rebelling. Finally Scipio Africanus conquered them by the destruction of Numantia (133). They joined Sertorius later, but after his death (72) became quite Romanised. See Hübner's article in Pauly-Wissowa's *Real encyclopädie*, iii., 1886-93.

Celtic Language and Literature, see GAELIC.

Celtic Ornament, which grew out of the Iron Age decoration in the Brit. Isles, may, for historical purposes, be divided into two periods: the pre-Christian, extending from 250 B.C. to A.D. 600, and that which followed the introduction of Christianity, and attained its highest excellence in the eleventh or twelfth century. In the earlier stage the metal most commonly used was bronze, and the chief fields of decoration were shields, scabbards, bracelets, harness mountings, and horse trappings. Repoussé work of low and high relief, done on thin plates which were afterwards riveted into position, has been found throughout the Brit. Is. in the beds of rivers and lakes, in earth houses, crannogs, and grave mounds, where also other products of C. art are constantly being found. Sometimes the repoussé design is enriched by champlevé, enamels of yellow, blue, green, and red, or by patches of coloured vitreous pastes. This is the case with a unique oval bronze shield, rescued from the Thames, where there are twenty-seven settings of red enamel. During these early centuries the C. artists depended on divergent spirals and elliptical curves for their designs, engraved lines or dots like a diaper filling up the pattern, which thus showed up against the plain groundwork. Many fresh elements of ornament, such as fretwork, with involved patterns, diagonal frets, and oblique lines, interlaced work and diapers of I- and Z-shaped designs, were added as further embellishments when paganism gave way before the new religion. And, further, there were now bells, croziers, shrines, churches, and above all the MSS. of the gospels and altars as fresh openings and encouragement for the C. artist. The Book of Kells in Trinity College, Dublin, and the Lindisfarne Gospels in the Brit. Museum, with their beautifully illuminated pages, their elaborated patterns of an almost inexhaustible variety, offer the finest illustration of the art of this period. But the enamelled metal work which still flourished is nobly represented by the Ardagh Chalice, and the Tara and Rogart Brooches and the Cross of Cong are fine examples of filigree and chasing work in gold and silver.

Celtis, Konrad (1459-1508), Ger. humanist, attended the lectures of Agricola at Heidelberg, and there founded a literary society. After travelling abroad and working to spread Ger. culture, he accepted in 1497 the chair of poetry and eloquence at Vienna, and became librarian to Maximilian I. It was whilst he was in his library that he discovered the map of the Rom. Empire pub. by Peutinger. Among his own pub. were *Odorum libri* (1513).

Celts, generic name of an anct. people, the predominant element in central and W. Europe before the rise of Rom. power and the influx of Ger. tribes. Great confusion has resulted from inaccurate use of the words Celt and Celtic. The dark-complexioned people of France, Great

Britain, and Ireland have been called Black C., while the tongues of the races of W. Scotland and Ireland are commonly termed Celtic. More properly they are Gaelic. Anct. writers never used the word of dark peoples. The Celtic characteristics were great stature, fair hair, and blue or grey eyes. All fair-haired peoples N. of the Alps were called *keltoi*. Physically there were two main groups closely allied: Scandinavians (Teutonic in modern writers), and peoples of France, Switzerland, and Italy (Celtic or Alpine race), standing midway between the Teutonic and the Mediterranean race (dark). C. appear to have settled in Gaul between 1200 and 700 B.C. Some had dwelt in the Alps and the Danube valley from the Stone Age. Others passed into Italy in the Bronze Age. In the sixth century B.C. they spread into Spain, and from intermarriage with the native Iberians in the N.-central parts, were called Celtiberi (q.v.). About the fourth century B.C. a great wave of C. invaded Italy, occupying Rome after the battle of the Allia, 390 (Liv., v. 34). Bought off, they retired to Sena Gallica. The Bituriges (a name still surviving in Berry) were the chief tribe. Others were the Arveni, Senones, Ambarri, and Ædui. These Gauls are often also called Cimbr. The most dreaded tribes came from the Baltic and the N. Ocean; hence the peoples now called Teutons were named C. The height of their power was about 400 B.C. In the third century they had spread as far as Greece and Asia Minor. Their raids were the terror of antiquity, but Caesar and Augustus reduced them to inactivity. Under the latter, Galatia, where numbers of C. had settled, became a prov. They founded no lasting state alone and preferred a pastoral to an agric. life. Their strength made them formidable foes, but they lacked discipline. Cato described them as 'devoted mainly to warfare and witty conversation.' In the Brit. Isles they remained independent for centuries. These island C., who were but colonists, were far less civilised than the continental C. During the 400 years after Caesar's expedition to Britain they became closely allied with their Rom. conquerors. They wore a sleeved blouse and trousers, fitting close to the ankle, with a tartan plaid across the shoulder fastened by a brooch, much like the costume of Highlanders in Queen Anne's time. They often had gold or bead ornaments, and enamel on their armour. The C. of Gaul and Belgium wore plated armour or chain-mail coats. They could work various metals (copper and iron), and discovered bronze. Among their weapons were swords, daggers, bows, pikes, slings, and javelins. They used two-wheeled chariots in war with a bronze scythe projecting on either side, and were notoriously good seamen. They had Druids, or priests, who performed magical ceremonies, which survived in the forms of the 'ordeals', augury, exorcism, etc. The clan system was deep-rooted. They had musical, poetical, and literary tastes, and were distinguished for dramatic talent.

Reading museum has interesting relics of the tn. of Silchester, an old Celtic centre.

The group of languages which are commonly known as Celtic belong to the Indo-European family. They now comprise Welsh, Breton, Irish, and Scottish Gaelic, and Manx. Cornish has died out. These are in close relation with the Italic and Germanic groups. See J. Beddoe, *Celtic Races of Britain*, 1885; W. F. Skene, *Celtic Scotland*, 1886-90; A. H. Keano, *Man, Past and Present*, 1899; J. Rhys, *Celtic Folklore*, 1901; D. Mathew, *Celtic Peoples and Renaissance Europe*, 1933; H. Hubert, *The Greatness and Decline of the Celts*, 1934; V. C. Childe, *Prehistoric Communities of the British Isles*, 1940; J. A. MacCulloch, *The Celtic and Scandinavian Religions*, 1949.

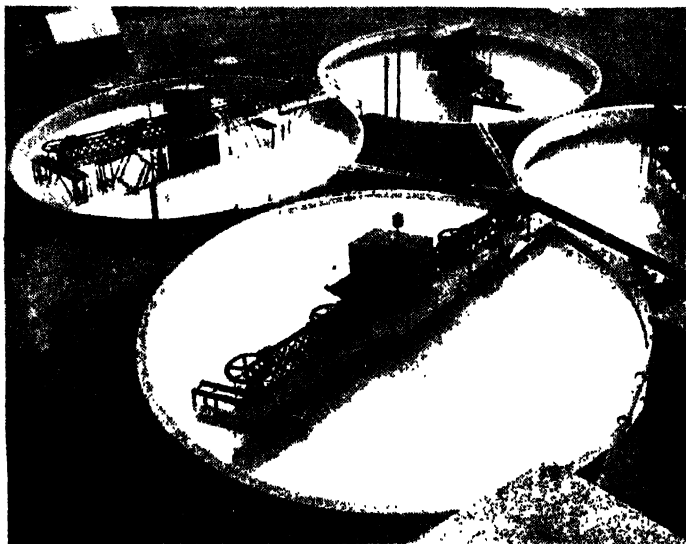
Celyphus, genus of dipterous insects which resemble little beetles rather than two-winged flies, on account of the enlarged scutellum which hides the reduced abdomen. *C. abjectus* inhabits Java. *C. scutatus* the E. Indies.

Cement, material used for binding surfaces together or for uniting particles in one mass. There are many varieties manufactured in various ways according to the purposes to which it is to be put. The chief kinds used for building purposes are Rom. C., Portland C., and the plaster of Paris Cs. These prepared from pitch are known as bituminous Cs., and then there are glues, pastes, etc., used for small operations. The manufacturing process of building Cs. consists of the formation of silicates and aluminates of calcium by the intense heating of lime with clay, the first being derived from chalk or limestone by driving off the carbon dioxide. It has been shown by Newberry that the chief hardening constituent of C. is tricalcium silicate ($3\text{CaO} \cdot \text{SiO}_2$), and that dicalcium aluminate is the chief setting agent. The usual composition is found to be about 22 per cent of SiO_2 , silica, 7 per cent of Al_2O_3 , alumina, 62 per cent of lime, and small quantities of iron, soda, magnesium, and sulphuric acid. *Roman C.* may be termed a natural C., as opposed to the artificial nature of Portland C. It was unknown to the Romans, and is also called Parker's C. from the name of its inventor (1796). It is a very quick-setting C. (less than thirty min.), and was much used before the invention of the cheaper and stronger Portland C., which has ousted it from its superior position. It is prepared from the nodules known as septaria which are found in shale, especially in the Isle of Sheppey and its neighbourhood. It is similar to hydraulic lime, being quick in setting, and owing to the fact that it sets rapidly under water is used extensively in hydraulic works, such as breakwaters, piers, sea-walls, etc. The nodules consist of about 20 per cent of silica and 15 per cent of alumina. They are calcined to drive off the carbon dioxide and ground fine. *Portland C.* is the most widely used C. and is manufactured in enormous quantities; America takes the lead in this respect. It is, unlike Rom. C., an artificial product prepared by the admixture of chalk and clay. It was invented by

Joseph Aspdin, of Leeds, in 1824, and was primarily an Eng. industry, the seat being the lower reaches of the Thames and Medway, where mud was plentiful, and this locality still produces the greater part of the C. made in Britain. The process of manuf. has now reached a high state of perfection, and is divided into three parts: (1) the preparation of the raw materials; (2) calcining the clinker; (3) crushing and grinding the finished product. There are two processes, the wet and the dry, which are used according to the nature of the materials used the dry process being used where the materials are too hard for the wet treatment. The original method is the mixing of riv. mud and soft chalk; the wet is the natural process, and this will be described first. The materials are mixed in a wash mill, which consists of a basin of brick or masonry with a masonry pier in the middle. On the latter is fixed a vertical revolving shaft to which horizontal arms are attached. From these hang harrows or vertical iron bars which dip into the materials mixed with water and rotate with the shaft. This thoroughly mixes up the sludge and breaks up any of the lumpy parts. The product is known as slup or slurry and passes out of the mill through a grating of such div. as to let pass any particles under a certain fineness. Stones accumulate at the bottom of the mill basin and can be easily removed, while any hard lumps of chalk must be ground by rollers. In the dry process the materials are dried before admission to the mixing, and various methods of drying are adopted. Briefly, these are the drying drum and the drying kiln. The first consist of a revolving cylinder or drum, through which the materials are gradually passed while the whole is heated. In the kiln there are two walls. In the interior space is a furnace, while the materials pass through the space between the two conical brick walls, damp being fed in at the top and dried material taken out at the bottom. As the kiln is kept full, the process can be kept continuous in operation. The materials before drying are crushed in a 'ball mill,' which consists of a rotating drum containing steel balls which, by means of steps, drop across from side to side. After crushing and drying the materials must be mixed in the right proportions, and this is done in mixing bins. Then the mixed materials are passed through a tube mill and thoroughly ground. This mill consists of a long tube revolving on its axis and filled with hard flint pebbles, the finely divided powder passing through gratings into a casing. After either of these processes the material is ready for calcining. This can either be done with the materials in the form of bricks as resulting from the wet process, or with powder from the dry process. The best form of kiln is the rotary kiln, although others are sometimes used. It consists of a long, cast-iron tube lined throughout with firebrick and slightly inclined to the horizontal. The material enters at the upper end and the blast or

burning material at the lower. A chimney at the top serves to create a blast and carry away the gaseous products of combustion. The whole rotates at a fixed slow speed. The usual method of calcining is by means of coal dust, which is carried into the kiln by an air blast and on reaching the heated portions takes fire and gives out an intense heat. The final process consists in the grinding of the clinker product. This is very important, since it is found that the finer the grinding the more satisfactory and strong the resultant C. The grinding is similar to

employed in testing and the results which should be found can be seen in a report issued by the Engineering Standards Committee, to be obtained from their offices, 28 Victoria Street, S.W. We now come to the plaster Cs., which are of various kinds, but have the most important constituent in common. This is gypsum or sulphate of lime, which in the dehydrated state is known as plaster of Paris. Cs. of this class are used in internal work, being partly soluble. *Plaster of Paris* is manufactured as follows: The gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), found in many



Cement Marketing Board

A GROUP OF SLURRY MIXERS

that employed in the case of the raw materials, taking place in tube mills, but is performed in two stages. First there is a coarse grinding and then a fine. The finishing process is such that on sifting through a 180-mesh sieve (i.e. one with 32,400 holes to the sq. in.) the residue is generally about 15 per cent; at any rate it must not be more than 22½ per cent. The next item in the process is testing the C. This is done both with neat C. and also with a mixture of one part C. and three parts sand, as is generally used. The C. is gauged with as little water as possible and moulded into briquettes with a waist section of 1 sq. in., and the tensile strength, or crushing strength, is measured in testing machines. This is done at intervals, for instance, on the first day, the seventh, fourteenth, etc., the strength gradually increasing. Full particulars of the methods

localities, especially in the clays of anct. riv. basins, is deprived of a portion of its water of crystallisation by heat, and powdered very fine. It is then very eager for water, and on its addition rapidly crystallises in small hard crystals in which the water is taken up. Thus a hard mass is produced, which is found useful in internal plastering and uniting metal with glass. It is fairly hard but not sufficiently so for places liable to be knocked about, such as skirtings, dados, etc., and special compositions are made for this purpose. Among these are *Keene's C.*, which is made by soaking the plaster of Paris in strong alum solution and then recalcining it, and *Parian C.*, treated in a similar way with strong solution of borax. Other types of C. are *Grapier* and *Le Farge*, made by finely grinding the hard lumps left when hydraulic limes are slaked and sieved.

They consist of unchanged limestone and calcium silicates. There are also Cs. called iron Cs. or iron ore Cs., in which ferric oxide replaces a large part of the alumina. There must always be some alumina present, for all attempts to prepare Portland C. in which the whole of the alumina is replaced by iron oxide have met with failure.

Another class now much used is the magnesium oxychloride or Sorel's Cs., formed by the reaction between magnesium chloride, water, and prepared magnesite; the composition of the product varies with temp., proportion of ingredients, time of reaction, etc. Mixed with fillers, such as wood-flour, cork, talc, silica, asbestos, marble dust, etc., it forms the product much used as a sanitary, resilient stone flooring in large modern buildings. Another class of Cs., and a class of increasing importance, is that composed of Cs. with tar or pitch as their prin. constituent. Asphalt is a natural product which, heated and mixed with small particles of stone, forms a durable and easily worked surface. The surfaces of main and other roads are covered with a layer of pitch mixed with ground shale or sand and rolled, which, in addition to being free from dust, is easy to lay and keep up. Tar macadam has undoubtedly a great future before it in this respect. C. of this sort is also used to render walls damp-proof. The last class of C. is that consisting of various adhesives used in small quantities, such as gums, glues, pastes, and so on. Some have particular application for special work. Thus *Canada Balsam* is a resin obtained by piercing the bark of the Amer. balsam-fr. Its chief property is its transparency when set, which makes it eminently useful in optical work for cementing together glass surfaces. *Paste* is used for cementing paper and is made from flour or starch, the flour being rubbed up with water and boiled. The addition of water before boiling improves the quality, making it thinner and stronger. In large quantities C. is used for wall-papering and bill-sticking, and can be made by mixing a quarter of flour with a quarter of a pound of alum into a creamy consistency with warm water, and then pouring on boiling water and stirring. As this paste is liable to become mouldy and putrid, it can be made permanent by the addition of a little corrosive sublimate. *Liquid glues* are prepared from shellac, which is caused to dissolve by boiling with borax. A useful and cheap C. is the *Red C.*, or *Faraday's C.*, used by instrument-makers for cementing glass to metals. It is made by melting five parts of black resin with one part of yellow wax and then stirring in gradually one part of red ochre in fine powder and previously well dried. *Mastic C.* is made by mixing twenty parts of well washed and sifted sharp sand with two parts of litharge and one of slaked lime. This is mixed with linseed oil, which sets by its property of absorbing oxygen. It is used for repairing stonework. Sodium silicate is also used for closing the pores and resisting attack.

See A. C. Davis, *Portland Cement*, 1934; C. Lynam, *The Growth and Movement in Portland Cement Concrete*, 1934; F. Lea and C. Dorsch, *The Chemistry of Cement and Concrete*, 1935.

Cement Stone, name given in geology to a layer of rocks which exist at the bottom of the carboniferous deposits of N. Britain. It has the appearance of being deposited from shallow water either fresh or brackish between the freshwater deposits of the Old Red Sandstone and the marine deposits of the lower sandstone shales and carboniferous limestones. Conditions point to the fact that after the formation of the Old Red Sandstones in large inland lakes there was a subsidence of the land and the C. Ss. were formed in large shallow marine lakes or deltas. C. S. forms an excellent building stone, being extensively used in Edinburgh for that purpose.

Cemetery (from the Gk. κοιμητήριον, a sleeping-place), piece of ground which is specially set apart for the burial of the dead. The name was originally given to the underground burial-places of the Romans. The Gks. always made their Cs. outside the cities, and the Romans placed their tombs generally by the side of the public roads. In the early ages, the Christians used to hold their religious ceremonies in the Cs., and it is believed that this fact brought about the practice of always consecrating the ground that was to be used for the dead. In modern times it has become the rule for each sect or denomination to have its own burial-ground, and each C. is consecrated according to the formula peculiar to the sect to which it belongs. Sometimes one C. is allotted to various denominations for the convenience of every one living in that dist. In Germany the Cs. at Munich and Frankfort-on-Main are called Leichenhäuser (houses of the dead), and are built so as to minimise the risk of premature interment. The Turks make picturesque Cs., as they are often surrounded by cypress-trees. The Campo Santo at Pisa in Italy is one of the most famous burial-grounds. See also BURIAL ACTS; BURIAL CUSTOMS.

Cenchreæ: 1. (Now Kenkri) was a city on the E. side of the Isthmus of Corinth in the Peloponnesus, Greece. It was from this port that St. Paul embarked when he left Corinth for Jerusalem. 2. Also the name of an auct. Gk. settlement in the Troad, probably situated some distance N. of Eneke in the plain of Bafra-meh (N.W. promontory of Asia Minor).

Cenci, Beatrice (1577-99). It, girl whose fame rests on the tragic and sordid character of her family hist. She was the child of Francesco C., a wealthy, passionate man, who proved a dissolute liver and a harsh father, and of Lucrezia, his second wife. She was involved in a plot to murder Francesco, who was assassinated whilst he slept, and after torture and confession was beheaded with her mother in 1599. Shelley's magnificent tragedy, *The Cenci*, is historically inaccurate, but has nevertheless made Beatrice one of the most heroic and

tragedal of women. Modern research has revealed the fact that she had an illegitimate child by one of her father's stewards.

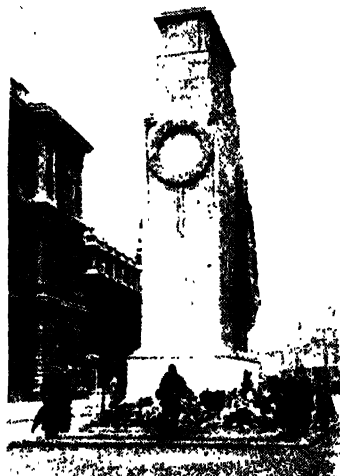
Cenis, Mont, pass, 6893 ft. high, on the border between the Graian and Cottian Alps in Savoy (France). The famous M. C. tunnel (opened in 1871) is not really under the pass itself, but lies below the Col de Fréjus, 17 m. to the W. It is 8 m. long. The railway runs through the Isère valley from Chambéry, and after crossing the valleys of the Arc and Maurienne reaches Modane (61 m. from Chambéry). One terminus of the tunnel is Bardonnèche, some way above Oulx, which is 18 m. distant from Modane. The carriage road, built by the Emperor Napoleon between 1803 and 1810, ascends the Arc valley for 16 m., from Modane to Lanslebourg, going down from the heights by way of the C. valley to Susa (37 m. from Modane), where the road meets the railway. Lanslebourg is only 8 m. from the hospice near the summit of the pass. The Little M. C. (7166 ft.), which is supposed to be Hannibal's pass, connects the main pass with the Etache valley on the Fr. side.

Cenomani, offshoot of the Auleri, a people who inhabited Gallia Celtica, an ant. div. corresponding to the modern Maine in the dept. of Sarthe. This people helped the great rebel Vercingetorix in the rising against Caesar in 52 B.C., constituted under Augustus a *civitas stipendiaria* of Gallia Lugdunensis, and in 400 B.C. invaded Italy and occupied the ter. of the Etruscans they conquered, making Verona and Brixia their chief tns. They were allies of Rome in the Gallic war (225 B.C.) and in the second Punic war, but they helped the Gauls in the latter's revolt under Hamilcar (not the father of Hannibal) and only finally submitted to Rome following their defeat by Gaius Cornelius (197 B.C.).

Cenomani, name given by Fr. geologists to the lower portion of the Upper Cretaceous period.

Cenotaph (Gk. *κενός*, void; *τάφος*, a tomb), monument or memorial stone to the memory of someone whose body lies elsewhere. Cs. are very common for drowned persons. An added significance attaches to the word since the First World War. In England, the C., *par excellence*, is that which stands in Whitehall, London, near the end of Downing Street. The original C. was a temporary structure made of wood, erected hastily for the peace procession on July 19, 1919. The architect was Sir Edwin Lutyens, who drew up the plans overnight and submitted them to the gov. the next morning. The design is of striking simplicity, and has an air of dignity seldom found in such memorials. In 1920 it was decided that the temporary structure should be demolished and a permanent one erected on the same site. This gave rise to much criticism in the press; it was considered that the site was unsuitable owing to the busy traffic at this spot, and that the monument should be placed on one of the grass plots in Parliament Square near the House of Parliament. The original

view, however, prevailed, and no traffic problem has arisen. As the memorial is to all who d. or were killed in the First World War and who lie buried in every theatre of war, irrespective of creed, denomination, or belief, a purely Christian inscription was out of place. It was therefore decided to inscribe on it the words 'TO OUR GLORIOUS DEAD'. It was intended that the flags upon it should be of stone, the colours being driven in by a new process. This, however, was not carried out, and three bunting flags fly on two faces of the



D. McLeish

THE CENOTAPH, WHITEHALL, LONDON

memorial. The cost of erection was £10,000. Sir Edwin Lutyens gave his services without remuneration. It is still the general practice of all male civilians to uncover their heads in passing the C. out of respect for the dead who gave their lives in the First World War. On every anniversary of the signing of the Armistice (Nov. 11) a mass memorial service is held at the C. in which the royal family, the gov., and representatives of all important bodies, etc., participate. The service was, however, omitted during the war years 1939-45. A new inscription was unveiled by King George VI. on Nov. 11, 1946. It consists simply of '1939' and '1945' in rom. numerals. The dates of the First World War, in similar numerals, are carved high on the C., the '1914' looking S., the '1918' on the opposite face. The new dates are between them, to face W. and E. at the same horizontal level.

Censer (from Lat. *incendere*, to kindle),

vessel used in both Christian and pagan places of worship for the burning of incense.

Censorinus, Lat. grammarian and also a versatile writer, fl. about the middle of the third century A.D. He wrote a book called *De Acentibus*, which has been lost, and he also wrote a treatise called *De Die Natali* in the year 238, and dedicated to Quintus Cereilius (Cereilius). The work is extant, and deals with various subjects, such as astronomy, music, religious rites, natural hist. of man, etc.

Censors (Lat. *censere*, to assess, judge): 1. Originally the name of two Rom. officials, dating from the time of Servius Tullius. After expulsion of the kings (c. 510 B.C.), the office was held by the consuls, but special magistrates were again appointed 443 B.C. Till 351 only patricians were C.; the plebeian Marcus Rutilius was then chosen (Livy, vii. 22). In 339 Lex Publilia enacted that one must be a plebeian. In 131 both were plebeian for the first time. They were elected on the same day in Comitia Centuriata, with a consul presiding. The term of office, at first five years, was later limited to eighteen months. This magistracy was considered the highest dignity in the state, except dictatorship. The duties were three: (a) The original taking of the census, or register of citizens, and their property (held in Campus Martius); (b) the *regimen morum* (regulation of morals), most dreaded of all their powers, this superintendence gradually spreading to private as well as public life; (c) administration of the state finances, including regulation of *tributum* (property tax), and of *vectigalia*. These were usually leased out to speculators (*publicani*, 'farmers' of the taxes). Upkeep of public buildings and care of the treasury were entrusted to C. Their powers were vast and undefined; only his colleague's *intercessio* (veto) could overrule a censor's decisions. C. could degrade men from or promote them to the rank of senator or knight at choice, until Sulla's legislation, 81 B.C. They might class citizens with *aequali* with no vote. They introduced various sumptuary laws. In 265 a law forbade reelection to censorship. In 338 they drew up the list of senators (*lectio senatus*). Their dreaded stigma, *nota censoria*, might be affixed to any name on their lists, but the successors of one pair of C. could remove it. Augustus exercised censorial powers himself as consul (8 B.C. and A.D. 14). Claudius, Vespasian, and Domitian revived the office. Trajan and later emperors acted as C. without actually assuming office.

2. The name is now extended to one who controls or censures the action of others; to critics of literary or artistic work, and judges appointed by gov. to examine plays or songs before their publication. It is also the title of the official head of non-collegiate students at Oxford and Cambridge. The C. of the Royal College of Physicians grant licences.

Censorship of the Drama, power that originally sprang from the royal prerogative.

The C. of the D. has existed ever since the rise of the Eng. drama in the period of the Renaissance. In the time of Henry VII. court entertainments were supervised by a master of the revels, and from that date to the middle of the seventeenth century, when all theatres were suppressed by law, playwrights were subject to the control of either the master of the revels or the court of Star Chamber. According to writers on the constitutional hist. of England, it is not certain at what date the lord chamberlain first began to exercise a direct control over plays, but the records of the lord chamberlain's office show that as early as 1628 that functionary either personally or through his subordinate, the master of the revels, licensed and exercised a general control over dramatists. From being an emanation of the royal prerogative his powers ultimately, in 1737, became statutory. The object of the Act of 1737 was mainly political, a fact which is sufficiently indicated by the preamble to the Act, which recites that its purpose was to 'restrain the political and personal satire which was then prevalent on the stage, which the gov. of the day found embarrassing, and which the censorship as it then existed was found ineffective to curb.' On the passing of this Act the lord chamberlain appointed a licenser or examiner of plays, with a salary of £400 a year, and that office has continued in spite of criticism down to the present time. The Act of 1737 conferred an unfettered power of veto on the lord chamberlain, and it was only when the Theatres Act, 1843, was passed that the legislature gave any indication of the principle on which the veto was to be exercised. Under the Theatres Act, 1843, the lord chamberlain has power (1) to prohibit the performance of unlicensed stage plays anywhere; (2) to license theatres in certain places; (3) a practically arbitrary right to ban any stage play which in his opinion is contrary to 'good manners, decorum, and the preservation of the public peace,' words which the joint committee of 1909 characterised as vague, and 'the only existing statutory authorisation' of this particular aspect of the lord chamberlain's powers. Under this Act all new plays and every addition to an old play must be sent to the lord chamberlain by the theatre manager who proposes to produce it at least seven days before it is intended to be performed accompanied by a fee for perusal of not more than two guineas. The lord chamberlain has local jurisdiction to license all theatres in the cities of London and Westminster, in Finsbury, Marylebone, the Tower Hamlets, and also in Windsor and other places where there is a royal residence. According to the report of the joint committee the co. councils license places to be used in their cos., and the univ. authorities of Oxford and Cambridge have a veto as to the performance of plays within their respective jurisdictions. Lineally descended from the control of court festivities vested in the master of the revels,

legally owing its origin to political exigencies as set out in the Theatres Act, 1737, the C. of the D. really has its roots deep down in the civil and religious intolerance of a bygone age. The social conditions, which in reality or apparently necessitated an autocratic exercise by the lord chamberlain of his supervisory powers over the drama, were also conditions pre-eminently incompatible with even the bare idea of liberty of discussion, far less of the constitutional freedom of the press. The kingship as yet was personal, the gov.-supporting body strictly aristocratic, in spite of the triumph of the parl. cause in the early Stuart period, and nothing which in any way prejudiced such traditions was to be tolerated for a moment. 'Players' were legally and socially regarded in the light of rogues and vagabonds, living rather by the charity of their masters than from any title to their earnings. So diametrically opposed are modern ideas to such conceptions that the institution of the C. of the D. was hardly likely to go unchallenged in the progress of time. But until recent years opposition to it was of no very open or sustained character, and three joint committees, in 1853, 1866, and 1892, respectively pronounced succinctly in favour of its continued existence.

The year 1908 and succeeding years, however, saw a remarkable manifestation of hostility to the C. of the D. on the part of a number of distinguished persons in the literary world, the exciting cause of which was the refusal by the lord chamberlain, on the advice of his examiner of plays, to license three plays—*Waste*, a skit on *An Englishman's Home*, and *Monna Vanna*. As a result of widespread criticism of his action in the press, a joint committee of both Houses was appointed in 1908 to inquire into the working of the C. of the D. A considerable number of well-known writers, actors, and theatre managers gave evidence before the committee. Generally speaking, the dramatists and other writers were against, and the actors and managers in favour of, the continued existence of the C. of the D. A remarkable feature in the evidence was the admission by the examiner of plays that in advising the lord chamberlain on the various plays submitted to him he proceeded on no principles that could be defined, but based himself on custom, and followed the precedents of the office: his practice was to refuse a licence where plays were avowedly adapted from the Scriptures, contained political allusions likely to jeopardise friendly relations with a foreign state, or had an immoral tendency. Since his inception of office in 1895 the examiner said that some 7000 plays had been submitted to him, of which forty-three were refused licences, though fourteen of these were subsequently reconsidered and the licences issued; the majority of his refusals were on grounds of immorality. The figures given by the examiner, however, in no way represented the true measure of his activity, for in countless instances

plays were only licensed after modifications to meet objections. The absence of principle or certainty in the quasi-judicial functions of the reader was exemplified by the refusal to license Shaw's *Mrs. Warren's Profession*, D'Annunzio's *La Città Morta*, and *The Breaking Point*, while at the same time passing *Dr. Walkure* and *The Christian*, and other plays which, though dissimilar in treatment and action, yet contained parallel incidents. The gravamen of the dramatists' grievance was that the suppression of a play before production was an excessive use of executive power, and cast a stigma on the profession of the dramatist; and that it was an anomaly to place the drama under restrictions other than those imposed by the ordinary law of libel and blasphemy. The actors, on the other hand, feared that if the C. of the D. were replaced by magisterial and police control, an element of uncertainty would be introduced into their calling, and place in constant doubt the employment of numbers of persons who were not directly concerned with the ethics of the dramatic art. The committee recommended: (i.) That the lord chamberlain should remain the licenser of plays, with the duty of licensing any play submitted to him, unless he considered it indecent, offensively personal, calculated to do violence to the sentiment of religious reverence, to impair relations with any foreign power, to cause a breach of the peace, or to conduce to crime or vice, as representing in an invidious manner some living person, or some person recently dead. (ii.) That it should be entirely optional to submit a play for licence, and legal to perform an unlicensed play. Where any unlicensed play contravened the stated bounds the matter should be left to the director of public prosecutions. In spite of repeated questions in the House, and a petition to the king signed by sixty dramatists and a number of representatives of repertory theatres, dramatic societies, musicians, artists, and novelists, nothing was done to give legislative effect to the proposals of the joint committee. An account of the sittings of this committee together with a sane criticism of the present system of the C. of the D. is contained in the introduction to Bernard Shaw's *The Shewing-up of Blanco Posnet*, 1909. One weakness of the C. of the D. is that pornography when sugared with farce and fun is more likely to be granted a licence than when serious in intent. It is notorious that variety shows invariably escape the censor, and moreover the examiner of plays who considers only the text of the play has no control over its production. However, *Young Woodley* by John Van Druten, 1929, was refused a licence which was afterwards granted when a private performance had been witnessed. That the lord chamberlain's licence is an invaluable safeguard is proved by the alternative systems which at present obtain in the U.S.A. In 1927 the Wales Act was inaugurated in New York State, and by its terms a

theatre which has seen the performance of a play subsequently banned in the police courts may be padlocked for a whole year, to the heavy loss of its possibly innocent owner. In Boston theatres are licensed for a season, but licences may be suspended by order of the mayor, the police commissioner, and the chief justice. The work done in England by the lord chamberlain's dept. is in America carried out by the secretaries of watch and ward societies. Of the two the lord chamberlain's office is the more susceptible to public opinion. See V. C. Gildersleeve, *Government Regulation of the Elizabethan Drama*, 1908; F. Fowell and F. Palmer, *Censorship in England*, 1913; and M. L. Ernst and W. Seagle, *To the Pure*, 1929.

Census, enumeration of the inhab. of a state taken by order of its legislature. In ant. Rome C. meant an authentic declaration made usually every five years by every Rom. citizen before two magistrates called censors, of his own name and age, and of the name and age of his wife, together with a statement of the number of his children and slaves. The Rom. C. differed from a modern C. in respect of both its purpose and scope. Its object was mainly fiscal; but it was also designed to ascertain the number of men capable of bearing arms. Taxation depended on the results of the Rom. C. Livy states that it also showed the amount of a man's debts and the names of his creditors. Rom. citizens were divided according to the valuation of their property at the C. into six classes, each class containing a number of centuries or hundreds. As the richer classes contained far more centuries than the poorer, it is obvious that the influence of wealth was greatly preponderant in the *Comitia Centuriata*, the legislative assembly of ant. Rome. From the codes of Theodosius and Justinian, it appears that the scope of the Rom. C. became widened under the empire. It had become a complete register of the pop. and wealth of all the centuries included within the limits of the Caesar's dominions. Full as it was, however, it was in no sense a statistical record like a modern C., and was apparently in no way conceived to further the social progress of the people at large. The first actual enumeration of the people of England and Scotland was made in 1801. The topics of inquiry were the number of persons, the number of inhabited and uninhabited houses, and the number of families in each par. It attempted a classification of the employment of individuals under the very general divs. of agriculture, trade, manufs., and handicraft. The inquiry under this last head entirely failed, owing to the confusion engendered by the classification into families. The next C. was in 1811, and since 1801 the C. has been taken every ten years, excepting 1941. In the Cs. of 1811 and 1821 the official form of inquiry was modified so as to obtain a more accurate return of the occupation of the people. The heads of inquiry in 1841 were more numerous and minute, with the result that more accurate information was obtained. In reference to occupation,

the enumerators were directed to ascertain the employment of *every* person, distinguishing sex, instead of merely, as hitherto, the employment of families and males over twenty. Furthermore, the exact age of every person was ascertained, instead of quinquennial and decennial periods being taken, and the place of birth was also a subject of inquiry. The C. of 1851 was much facilitated by the system of registration of births, marriages, and deaths, which came into operation in 1837. Prior to that time the unchecked par. registers were the only available sources of information. The C. of 1851 showed a marked advance on its predecessors in regard to what may be termed social statistics. For the first time the number of blind, deaf, and dumb persons was recorded. It also made inquiry into the eccles. and educational condition of the country by ascertaining the amount of church accommodation at the command of each denomination, together with a return of the numbers of all the congregations on a particular day. This C. brought into prominence the sudden and startling decrease in the pop. of Ireland. In 1861 the C. exhibited for the first time the number of aliens and naturalised Brit. subjects in the United Kingdom. The pop. of Ireland continued to show a decrease. The first C. of Ireland was taken in 1813, but it was not till 1821 that it was in any true sense an accurate or complete record. In 1871 the C. was extended to cover the Brit. Empire (apart from indigenous non-white races in the colonies), and since that year the mode of taking the C. has in no essential been improved upon. The accuracy of this C. was ensured by the div. of the country into enumeration dists., with a clear indication of the various confusing local governmental or municipal subdivisions of the kingdom. One striking feature of the C. of 1871 was that the *names* of persons were required, and to facilitate inquiry a separate schedule or form was sent out to each householder. Special schedules were issued for Welsh people, persons in public institutions, on board ship, and homeless or houseless persons. In regard to the last mentioned the co-operation of the metropolitan and co. police was enlisted. The comparative rate of mortality in various occupations was also inquired into by classifying the living in the different occupations or professions with regard to age. Subsequent Cs. have still further widened the field of inquiry and elicited a mass of valuable information in the way of social and vital statistics; in 1901, for example, investigation was made into the evils of overcrowding by inquiries as to the number of persons occupying any particular room or part of a house. The following additions were made to those subjects in 1911: (a) the duration of existing marriages; (b) the number of children born to such marriages; (c) the industries or services with which workers were connected, as distinct from the occupations in which they were personally engaged; (d) in the case of persons born

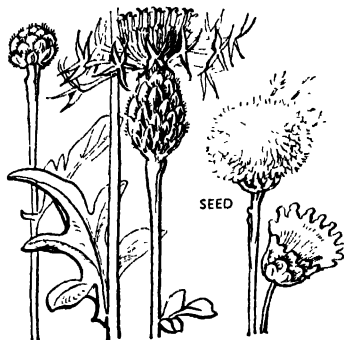
outside England and Wales, whether they were residents or visitors in this country; (e) the number of rooms in all dwellings, instead as heretofore in dwellings of less than five rooms only. In contrast to the prejudice, especially in certain ecclesiastical quarters and among the ignorant, excited by the earlier Cs., it was noteworthy some years ago, that the registrar-general expected fuller and more accurate returns than ever on account of the interest evinced by the public in the C., an interest which he attributed to the aid rendered by the press; to the co-operation of the parl. committee of the Trades Union Congress, and to the efforts of elementary school teachers who gave special C. lessons to children under their charge.

The total pop. in England and Wales was 8,892,536 in 1801; 10,164,256 in 1811; 12,000,236 in 1821; 13,896,797 in 1831; 15,914,148 in 1841; 17,927,609 in 1851; 20,066,224 in 1861; 22,704,108 in 1871; 25,974,439 in 1881; 29,002,525 in 1891; 32,527,843 in 1901; 36,075,269 in 1911; 37,885,242 in 1921; 39,947,931 in 1931; 41,460,000 (estimated) in 1941. The pop. of Great Britain and Ireland a month before the beginning of the First World War was officially estimated at 46,989,249. There were over 1,000,000 more females than males in England and Wales in 1911, and, by 1921, the excess, aggravated by the losses of men in the war (about 1,000,000), was 1,720,802, and in 1931, 1,670,143. It is significant that the loss of pop. owing to emigration, which was 164,000 in 1871-81, 600,000 in 1881-91, 68,000 in 1891-1901, rose again to nearly 500,000 in 1901-11, for it seems established that the number of emigrants is greatest during times of prosperity. In 1913 the total number of Brit. and N. Irish emigrants was 416,278, in 1926, 284,009, in 1930, 327,992, and in 1931, 213,057. Since then, owing to quota restrictions in the U.S.A. and Canada and elsewhere, the number has steadily declined. Moreover, in the decade immediately following the First World War, there was a steady flow of migrants to the dominions overseas, which was enhanced by schemes of state-aided migration; but during the world economic depression, 1930-33, emigration declined to its lowest point, and in 1933 less than 30,000 Brit. emigrants went to places out of Europe, while immigrants of Brit. nationality coming into Great Britain in 1932 and 1933 numbered 75,000 and 60,000 respectively. The C. of 1911 showed a slight net gain by excess of births over deaths, a result due, however, to a relatively greater reduction in the death-rate than increase in the birth-rate. This reduction was accentuated after the First World War by reason of the very marked progressive decline in the birth-rate. In 1924 the excess of births over deaths was 301,438; in 1933 it was only 112,093; in 1934, 153,771; in 1935, 153,102; in 1936, 139,187; in 1937, 126,292; in 1938, 176,142; in 1939, 149,732; in 1940, 45,542; in 1941, 76,472; in 1942, 113,297; in 1943, 223,270. Those very fluctuating totals are explained by

war-time conditions and afford no true guide on vital statistics.

Cent and **Centime** (from Lat. *centum*, a hundred), names of coins. The cent varies in value according to the country. Thus in the U.S.A. and Canada it is a bronze coin, the hundredth part of a dollar, worth nearly an Eng. halfpenny, whilst in Holland the cent is made of copper, and is the hundredth part of a guilder (1s. 8d.). The centime originated in France, being a hundredth part of the franc, and before the revaluation of the franc in post-war years was equivalent to a tenth part of the Eng. penny. It was adopted in Belgium, and also in Italy, Greece, and Switzerland under different names, but to-day it is only in circulation in Switzerland. In Spain the real (2½d.) has been divided into 100 centimes.

Cental, measure of 100 lb. in avoirdupois weight. It is used not only in Great Britain, but also in America and Canada. This denomination appears in the Board of Trade standards.



CENTAUREA CYANUS: CORNFLOWER

Centaurea, cosmopolitan genus of Compositae consisting of numerous species which are of no practical importance to man, and are often mere weeds. *C. Cyanus*, the cornflower or blue-bottle, grows in Brit. cornfields and is often cultivated for its pretty many-coloured flowers; *C. moschata*, the purple or white sultan, and *C. suaveolens*, the yellow sultan, are garden flowers; *C. nigra* is the knapweed, and *C. Calceitrapa* the star-thistle.

Centaur, monsters, according to Gk. legends, which were half men and half beasts. The beast part is always depicted in art as being that of a horse. They were led by one named Chiron, and lived in the region of Mt. Pelion. They fought many fierce battles, but in the end Hercules killed most of them and drove the rest to Mt. Pindus.

Centaurus, the Centaur, 8. constellation, only a small part of which is seen above the horizon in the lat. of Great Britain. It is situated under Virgo and Libra and between Argo and Scorpio, and was supposed to represent the centaur

Chiron. This constellation, which was mentioned by Aratus, is bisected by the Milky Way. It has sev. points of interest, not the least being that it contains Alpha Centauri, which is apparently our nearest neighbour in the stellar universe. This star is of the first magnitude (0.2), and the fourth brightest star. It has a very considerable proper motion, being as much as 368 in. a century. Alpha Centauri is distant from the earth 270,000 times the distance of the sun from our planet. In other words, its distance in light-year units is 4½, that is to say, light travelling at 186,330 m. a second takes that number of years to cover the intervening space between Alpha Centauri and the earth. Alpha Centauri is a double star, one revolving around the other in seventy-nine years, and there is reason to believe from perturbations observed that there is also a third, albeit invisible, companion. The two luminous stars have a probable mean distance of 2,232,000,000 m. from each other. One of the twin has an identical spectrum with the sun, and is thought to be of the same mass and luminosity. Its companion is about the same size, but considerably less bright. Alpha Centauri is historically interesting as affording the first authentic result of the calculation of a 'parallax', Henderson publishing his determination of it in 1838. Alpha and Beta Centauri are known as the S. Pointers because they serve as a guide in finding the S. Cross.

Centaury, name applied to many plants, but most properly to *Erythraea Centaureum*, the common C., a species of Gentianaceae. It is an ann. herb with pink flowers, and was once gathered for the medicine of tonic property obtained from the flower-tops. The Amer. C. consists of the genus *Sabbatia*, and *S. angularis* has rose-pink flowers. The composite *Centaurea* (q.v.) is also often known as C. in popular language.

Centenary (Lat. *centenarius*, to do with a hundred), celebration of an event which happened 100 years ago, especially of the births and deaths of famous men.

Centering, see CENTRING.

Centerville, name of many post vils. and tns. in the U.S.A., the largest being the cap. of Appanoose co., Iowa, U.S.A., 30 m. S.W. of Ottumwa, on the Chicago Pacific, and other railways, where many industries flourish. Pop. 8000.

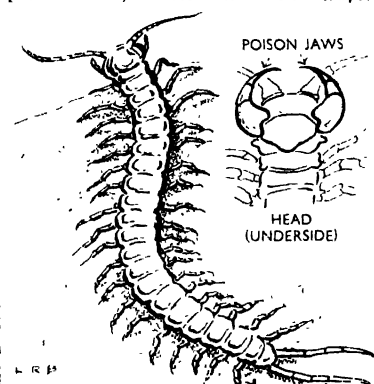
Centetes, typical of the family Centetidae, a small, insectivorous mammal found in Madagascar. The single species, *C. caudatus*, the tenrec, is sometimes known as the tallest hedgehog, and is distantly connected with the hedgehog within the same order. In length it is from 12 to 16 in., its teeth are forty-three in number, the young have spiny hairs, and the female brings forth about twenty little ones at a birth.

Centigrade Thermometer, see under THERMOMETER AND THERMOMETRY.

Centimetre, measure of length in the international metric system, being, as its name denotes, one-hundredth (0.01) of a metre. It is thus one-tenth of a decimetre, and is equal to ten millimetres.

A C. is equivalent to 0.394 in.; a cubic C. (c.c.) to 0.064 cubic in., and a sq. C. to 0.155 sq. in.

Centipede, or *Chilopoda*, order of Arthropoda in the class Myriapoda, in some respects resembling insects. The number of legs varies greatly, some species having only fifteen pairs, while others have as many as 173 pairs, and the term C. is consequently misleading. The galley-worms, as they are sometimes called, have flat bodies consisting of numerous segments, all but the last two bearing a pair of legs, and the first body-segment bearing a pair of poison claws, while the head has three pairs of jaws and long antennae. The species are carnivorous, killing their prey with their poison-claws, which in some tropical



CENTRIDI.

representatives are able to inflict fatal wounds upon man. They are creatures of night, light seeming to have little effect on them, as some are utterly devoid of sight and only one family has compound eyes. They lurk beneath stones or in houses, and at night attack small animals. The genera *Lithobius*, *Scoropendra*, and *Geophilus* are known to Britain; *L. forficatus* is our most common species; *S. gigas* a large tropical C., which attains a length of 12 in.; and *G. electricus* glows in the dark.

Centlivre, Susannah (c. 1667-1723), Eng. actress and dramatist. She was the daughter of a Lincolnshire gentleman of the name of Freeman. Bath is the tin. that first saw her drama, *The Perjured Husband*, in the year 1700. She also wrote nineteen other plays, the best known of which are *The Gamester* (1705); *Love at a Venture* (1706); *The Busy Body* (1709); and *A Bold Stroke for a Wife* (1718). Her plays were collected in the year 1761, and some of them long held the stage.

Centner, weight varying in different countries. In Austria, Denmark, Germany, and Switzerland, where it is most commonly used, it is equivalent in the

metric system to fifty kilogrammes (50,000 grammes), and in the Imperial to 110-231 lb. (avoirdupois). Commercially its value is 100 lb.

Cento (Gk. *κέντρον*, Lat. *cento*, patch-work), composition put together out of passages borrowed from other writings. The manu. of such an artificial work was a favourite literary exercise of the Romans. In the early centuries A.D., as later of the medieval monks. Virgil's *Aeneid* was especially subjected to this treatment. Thus on it were based both Ausonius's rapid survey of biblical hist. (fourth century A.D.) and Capitulus's attack on the immorality and luxury of monasteries (1535). The Empress Euloxia succeeded in stringing together a life of Christ from the Homeric poems.

Cento, tn. on the Reno, 16 m. N.N.W. of Bologna, with which it is connected by the canal of C., in Emilia, Italy. It is the bp. of Francesco Barbieri, the painter. Pop. 4320.

Centorbe, see CENTURIE.

Central Africa, British, see NYASALAND PROTECTORATE.

Central America, geographical div. extending from the Isthmus of Tehuantepec to the Isthmus of Panama. Mt. ranges traverse this portion of America from end to end. The Sierra Madre is the prin. range, which runs across Guatemala, and the highest point approaches close on 10,000 ft. These mts. extend S. into Nicaragua. The large volcanoes of Mexico and C. A. are situated on the Pacific side, and form a cordillera. These rise to great heights, as in Acateango in Guatemala (12,800 ft.) and Irazú (11,500 ft.) situated in Costa Rica. The amount of deposit from the volcanoes is very great, and covers a wide area. In some places this deposit has entirely blocked up the original structure of the country. Eruptions began in the Cretaceous period, and continue at the present time. The rocks are composed of lava and ashes, mostly andesitic and basaltic. Owing to the greatest elevation being on the Pacific side, the rivs. are shorter than on the Atlantic side. The prin. riv. is the Usumacinta, on the E. side, which is more than 600 m. long from its mouth to the Río de la Pasión. The average temp. on the low coast lands is from 80° to 73° F., and in those lands lying from 2000 to 5000 ft. above sea level the temp. is 73° to 63° F. Above this altitude frosts occur. The rainfall is exceptionally heavy on the Atlantic side, as much as 180 in. falling in the year in Alta Verapaz, Guatemala, while San Salvador has only 54 in. A more striking contrast exists between Greytown, with a rainfall of 244 in., and Rivas with 69 in. The flora ranges from Alpine to tropical. With regard to the forests, they are inferior in size to those found in the lats. in the E. hemisphere, but they are far more beautiful and luxuriant. In the volcanic regions the soil is extremely fertile, and yields in consequence splendid crops of rice, coffee, cocoa, and maize. The fruits grown are bananas, yams, pineapples, guavas, and citrons, while arrowroot,

beans, and tomatoes are largely cultivated. The woods found there are mahogany, cedar, logwood, and Brazil wood, cocoa palms, and mangroves also grow in this country. Of fibrous plants which grow in C. A. winter's bark, sarsaparilla, vanilla, and indiarubber are the representatives. Many beautiful orchids and flowers are peculiar to this country. With regard to the animals, these are as varied as the plants, but owing to the region being comparatively small, there are very few species that can claim to be peculiar to C. A. Pumas, jaguars, tapirs, monkeys, alligators, venomous snakes, vultures, and birds of brilliant plumage are found in great variety. There are as many as 260 species of birds, many of which are found only in this part of the world. Bats are so numerous that in some parts they have amounted to a plague, and whole vils. have been left deserted owing to the overwhelming swarms of these creatures. Insects are also present in large numbers, and are of the troublesome kind. The natives once consisted of the Maya Indians of the N., and there were smaller tribes in other parts of the country. At present the pure-bred Indian is mostly found in Guatemala and Yucatan, and only to a much less extent in other states. The greater part of the pop. is made up of half-breeds, but in Costa Rica Sp. people predominate. Scattered over the country may be found many very interesting remains, the prin. being the ruins of Palenque in Tabasco, Uxmal in Yucatan, Santa Lucia in Guatemala, and Copán in Honduras. C. A. is divided into republics named as follows: Guatemala, Honduras, Salvador, Nicaragua, Costa Rica, and Panama. Brit. Honduras is a crown colony belonging to England. The provs. of Chiapas, Tabasco, and Yucatan all form part of the Mexican republic. See T. A. Joyce, *Central American and West Indian Archaeology*, 1916; T. Gann, *Discoveries and Adventures in Central America*, 1928; H. G. Miller, *The Isthmian Highway*, 1929; W. W. Von Hagen, *Maya Explorer*, 1947; S. de Madariaga, *The Rise of the Spanish American Empire*, 1947; and *The Fall of the Spanish American Empire*, 1948; W. Beebe, *Book of Days*, 1948.

Central Asia (Russian) is nearly all comprised in the former prov. of W. Turkestan. There is some confusion over the precise delimitations of the great extent of country comprised under the old name of Russian or W. Turkestan—a ter. covering 1,534,000 sq. m., and supporting a pop. of over 16,000,000. Politically, Russian or Soviet C. A. comprises Uzbekistan (q.v.) on the frontier of Afghanistan, the foothills of the Tien Shan and Pamir Mts.; Turkmenia (q.v.), situated on the frontiers of Persia and Afghanistan, stretching from the Caspian Sea to the Amu-Darya R.; Tajikistan (q.v.), which lies on the frontier of Afghanistan and W. China; Kazakhstan (q.v.), the largest div. on the frontier of Sinkiang and stretching from the lower reaches of the Volga to the Altai, and from the mts. of the Tien Shan to the Trans-Siberian rail-

way; and Kirghizia (q.v.), also bordering W. China. Up to the revolution of 1917, Russian C. A. was divided politically into the khanate of Khiva, the governor-generalship of Turkestan, and the emirate of Bokhara; but after the revolution the Soviet Gov. abolished the governor-generalship of Turkestan (1920) and set up a Soviet republic in its place. Following a redistribution in 1924 of all these terrs., the new autonomous republics of Uzbekistan, Turkmenia, and Tajikistan were estab., advancing in 1929 to the status of Union republics; while the remainder of N. Turkestan, inhabited by the Kirghiz, were reunited to the S.S.R. of Kazakhstan (1924-25). But in 1926 Kirghizia formed its own autonomous republic, and in 1936 was, like Kazakhstan, elevated to the status of a Union republic. The Uzbek S.S.R. now includes the Kara-Kalpak autonomous S.S.R. On the N. Soviet C. A. is bounded by Siberia, on the W. by the Caspian Sea, on the S. by Persia, Afghanistan, and India, and on the E. by Sinkiang and Mongolia. There is a very sharp physical div. between the mountainous country to the E. and the deserts and steppes to the W. and N. The highlands are part of the orographical flange which skirts the N.W. border of the great tableland of C. A., and runs in a direction S.W. to N.E.. The great border chains of the S. Tien Shan consist of the Alai Tau, Trans-Ili, Kungur Alai Tau, Kokshal Tau, and Trans-Alai, etc., whilst many ranges, including the Chugiz Tau, Kandy Tau, Ferghana, Nura Tau Mts., etc., shoot off from these border chains in various directions. In both systems the heights of individual peaks vary from 10,000 to 20,000 ft., and Mt. Stahn attains an altitude of 24,590 ft. In this region, to the E. of the Academic range is the Fedchenko glacier, 50 m. in length, and (excepting the Arctic) the largest in the world; whilst perpetual snow covers many summits. Deep depressions such as the 'Dzunzar Gates,' Issykkul, etc., between the ridges spreading out westward have from time immemorial served as passes to the W. from the great central plateau. But the mean elevation of the passes is over 10,000 ft. The highlands are girdled by a belt of plains, known as the Balkash plains, whose average elevation is some 1250 ft., which in their turn are surrounded by the Aral-Caspian Depression—a great stretch of lowland occupying two-thirds of the whole prov., the altitude of which is rarely greater than 100 ft., sinking sometimes to below sea level. The Kara Tau Mts. separating the Svdarya and Chu Rts. are considered the line of demarcation. The higher girdle of plateau land, which is well drained by the Balkash, Ala-kul, Ili, and other rivs., which flow into Lake Balkash, support the countless herds and flocks of the Kirghiz. The Akkum steppe, with its wide expanse of shifting sands, encircles Lake Karakul. The lower and outer belt of plains belonging to the Turanian basin are watered by the Amu and Syr, which alone succeed in bridging the desert as far as the Aral Sea. The Murgab and Ted-

zhan dry up in the heart of the Kara Kum desert, whilst the Zeravshan gets no further than the gardens of Bokhara. In these plains the dividing line between oasis and desert is very clearly defined, whilst the only fertile soil is found at the base of the mts. The physical features of the country are perpetually changing. Hot desert winds are continually parching the numerous lakes; the sea of Aral, or the 'Blue Sea,' now fills only a fraction of its former basin; prosperous regions, where auct. civilisations flourished in Bokhara, Bactria, and Samarkand, have been swept away through the desiccation of riv. channels which were once their main arteries. The climate is continental, its salient feature being the scarcity of rain. Thus though precipitation is plentiful on the highlands, it is reduced to 11 in. at Tashkent, and is almost zero over the Transcasian steppes. The ann. variations in temp. are very considerable. Thus, whilst in Jan. the thermometer falls usually below freezing point, and has been known to register 10° F., a temp. of 100° F. in the shade and more is not uncommon in the summer time. Reflection from an arid soil aggravates the discomfort caused by the heat. The fauna include the Himalayan bear, marmot, badger, lynx, tiger, jackal, fox, wolf, antelope, zebu, hedgehog, etc.

Wild horses and camels are found, whilst the splendid *Ovis poli* abounds on the Pamir tableland. There are some 400 different species of birds, whilst the variety of insect fauna is almost countless. Arboreal vegetation is rare. Poplars, ash, juniper, maples, and pines occur, whilst apple and apricot orchards flourish on the lower mt. slopes.

In Kazakhstan the chief occupation of the agric. pop. is the growing of grain, cotton, rice, sugar-beet, and fodder-crops. There is also a large cattle- and sheep-breeding community, and livestock is exported. The recent industrial development of the country is based on its resources of coal, oil, salt, iron ore, copper, zinc, lead, and non-ferrous metals (of the last it has half of the entire deposits of the U.S.S.R.) on one hand, and the products of its agriculture on the other. The Karaganda coal basin has third place in Soviet coal-field output. There are extensive copper-refining centres. The chemical industry at Aktyubinsk provides fertilisers; here also oil wells are being developed to supplement the supplies found by the R. Emba, which are piped 550 m. to refineries at Orsk. The railway system, consisting in 1917 only of a line from Orenburg to Tashkent in Uzbekistan, has grown enormously and includes the Turksib route, connecting Novosibirsk with Alma Ata and Tashkent and sev. branch lines totalling over 4000 m. of track. The chief tns. are Alma Ata, the cap., with a pop. of 230,000; Karaganda, 166,000; and Semipalatinsk, 110,000.

In the four republics, vast deserts have forced the pop. to the oases and irrigated lands. The largest area of cultivation is around Tashkent in the sheltered

Ferghana valley; cotton and sugar-beet are the chief crops. Other fertile areas lie by Samarkand, and in the extreme S. near Tedzhien, Merv, and Stalinabad. Here, as on all the oases, cotton is the chief crop, and that, increasingly, of the Egyptian variety. Irrigation in the Vakhsha valley in Tajikistan has rendered 100,000 ac. of land capable of producing cotton crops. There is also some orchard cultivation, and a considerable co-operative silk industry. Mechanisation and the collective and state farm form of agriculture have been introduced. Merino and Astrakhan sheep are bred in Uzbekistan and Kirghizia; in the latter horse-breeding also is an important occupation. Industry is keyed to products of the Central Asiatic countries. Local cotton and silk production has built a large textile industry; vegetable oil is manufactured from cotton seed; and textile and agric. machinery is made at Tashkent. There are large chemical plants at Kara Bogaz on the Caspian Sea, and in the middle of the Kara Kumi desert which provide fertilisers. Coal is mined in Kirghizia and Uzbekistan, and there are oil wells at Nefto Dag on the Caspian, near Bokhara, and in the Ferghana valley. Of the cities, Tashkent is the largest of C. A. with a pop. of 585,000; Samarkand (156,000) was once Tamerlane's cap.; Ashkhabad (126,000) cap. of Turkmenia, is the terminus of the Asiatic railway. Bokhara (50,000) is an anct. city, noted for its handicrafts; Frunze (93,000) is the cap. of Kirghizia and Stalinabad (83,000) of Tajikistan. These and other cities contain many mosques, old buildings, mud walls, and relics of the anct. feudal states, close to the twentieth-century factories and flats. In Kazakhstan, two-thirds of the people are Kazakhs, descended from the nomadic herdsmen, and the remainder are Russian. The descendants of the old Iranian dwellers in the S. republics of C. A. are the Tajiks who now form about 14 per cent of the pop. The later invaders of the land, the Uzbeks, Turkmen, and Kirgiz have remained; one-half of the whole pop. are of Uzbek stock. Pop.: Kazakhstan, 6,146,000; Turkmenia, 1,254,000; Uzbekistan, 6,282,000; Tajikistan, 1,485,000; and Kirghizia, 1,500,000. See A. E. Voicov, *Le Turkestan russe*, 1911; E. Manin, *South to Samarkand*, 1936; E. K. Maillart, *Turkestan Solo*, 1938; E. S. Bates, *Soviet Asia*, 1942; J. S. Gregory and D. W. Shave, *The U.S.S.R.: a Geographical Survey*, 1944.

Central Australia, part of the N. ter. which, under the provisions of the Northern Australia Act of 1926 was divided into two parts, N. and Central, respectively; separated by the twentieth parallel of S. lat. It was administered by a gov. president and an advisory council. The Act of 1926 was repealed in 1931 and the whole of this ter. is now known as the N. ter., with Darwin as the headquarters of the administration and Alice Springs as that of the deputy in the S. It has a total area of 523,600 sq. m., lies between

129° and 138° E. long., as far as 26° S. lat. The estimated pop. is 10,800.

Central City, name of four small places in U.S.A., the largest of which is a tn. in Kentucky, with 4321 inhabs.

Central Criminal Court, estab. in 1834 for the trial of treasons, murders, and other felonies, and misdemeanours committed within the city of London and co. of Middlesex, and in certain specified parts of the cos. of Essex, Kent, and Surrey. Generally speaking the jurisdiction of the C. C. C. is assimilated to that of the criminal side of the assizes, and its judges or commissioners, like the assize or circuit judges, sit by virtue of commissions of oyer and terminer and jail delivery. The judges of the C. C. C. comprise the lord chancellor, who, however, never sits there, the judges of the high court, the recorder and common serjeant of London, together with the lord mayor and aldermen of the city of London, and such other persons as the Crown may appoint. In practice the recorder and common serjeant sit on the first two days of each session, after which one or more high court judges come down to try the more serious cases. The court is held at least twelve times a year, and more often if necessity arises. The dates of the sessions are fixed annually at a conference of the judges. The C. C. C., like the assize justices, has the power to try all offences committed on the high seas or within the jurisdiction of the Admiralty. The Admiralty jurisdiction extends over the territorial waters of the Brit. dominions, i.e. at a distance of 3 m. from low-water mark; but in the case of crimes committed on Brit. ships its jurisdiction extends not only over the high seas, but also in foreign rivers, 'as far as great ships go.' The C. C. C. also tries cases sent to it by king's bench div. It also has a transferred jurisdiction in cases removed to it from the various sessions of the peace within its dist.

Central Electricity Board, body estab. in 1927 under the Electricity Supply Act to control the production and supply of electricity in Great Britain, to concentrate production in the most efficient stations, to build and operate the 'grid' scheme for transmitting power in bulk from the main generating stations to the subsidiary distributing stations. In 1948 it ceased to exist, its functions being assumed by the Brit. Electricity Board.

Central Falls, manuf. city in Providence co., Rhode Is., U.S.A., on the Blackstone R., and the New York, New Haven, and Hartford railway, 4½ m. N. of Providence. Pop. 25,000.

Central Force, force which tends to produce acceleration towards a centre, or focus. If a stone be tied to a string, and be made to move uniformly in a circular path, there is always a tension in the string pulling the stone towards the fixed end. If the string be suddenly cut, the stone will move in a straight line tangential to the circle with the velocity it possessed at the time the string was separated. If the string remains intact the direction of the stone for the next

moment will be somewhat nearer the centre than if the string had been cut. This shows that during that moment a force acts on the stone pulling it towards the centre: this is called central or centripetal force. The idea of C. F. has a special importance in the hist. of astronomical research. Prior to the time of Kepler (1571-1630) it was believed that all revolutions of celestial bodies were performed in circles, but after much study of successive oppositions of the planet Mars, Kepler was convinced that the orbit of the planet was an ellipse, the

Kepler to calculate the relation between the orbit of a comet and a centre or focus was frustrated by mistaken notions as to the nature of a comet's tail.

Centralia: 1. City on the Crooked Creek, in Marion and Clinton cos., Illinois, U.S.A., 59 m. E. by S. of St. Louis. It is on the Illinois Central railway, etc., and besides having an important fruit market, has glass, granite, and iron works, woollen mills and cannery factories. Pop. 16,000. 2. City in Lewis co., Washington, U.S.A. Pop. 7000.

Central India, name used to denote a group of native or feudatory states bounded on the S. by the Central Provs., on the E. by Bengal, and on the N. by the United Provs. and Rajputana. This group is divided into two large divs., i.e. Baghelkhand in the E. and Bundelkhand in the W. Among the important sub-divs. of the group are Bhopal, Rewa, and Indore. The natives make articles of carved wood, painted and carved ivory, and brass. Silk, cotton, and woollen articles are also manuf. The climate is very hot and sultry. The area is 51,531 sq. m., and the pop. about 6,000,000.

Centralisation, term indicative of the system of concentrating administrative functions in the hands of the prin. depts. of the State. In political science it is the exact opposite of what is implied by the doctrine of *laissez-faire*, or that manner of carrying on the gov. of a nation in which the people are permitted to regulate themselves with as little interference from the central or supreme authority as is compatible with the conception of an independent political society. The irreducible minimum of the functions of the State, which, according to Herbert Spencer, comprise the duty of keeping order within the ter. of the State, and of defending its borders from external aggression, has in more recent times become so expanded that much that was formerly left to the discretion of local governing bodies has been transferred to State depts. With the remarkable increase in municipal trading in England, the introduction of so much legislation on the lines of social reform, and the great activity in matters appertaining to public health, the functions of such depts. as the Home Office, the Board of Trade, and the Ministry of Health have necessarily become even more comprehensive. There can be but little doubt that C. secures uniformity in institutions, and that what may appear to be encroachments by the State amount in the end to nothing more than an enlightened conception of what is connoted by the obligation to preserve internal order in a state. The same increase in central authority is everywhere observable among civilised nations, and although many schemes of 'decentralisation' have been mooted, it may be that such schemes really relate to the wider and altogether different idea of federalism. All powerful modern states are necessarily more or less under the sway of militarism, and this is probably the main factor in the dominance of C.



Paul Popper

A MARWARI WOMAN OF CENTRAL INDIA

-sun occupying one of the foci. He also concluded that the velocity of the planet was not uniform for any given arc, but that if points on the orbit were joined by straight lines to the focus, the areas described in equal times were equal. Kepler's knowledge of the laws of mechanics was necessarily not very profound, and he appears to have been guided by happy inspiration as well as aided by patient and prolonged calculation. Acting on the guiding principle of the uniformity of nature, he applied his 'laws' to other orbits, and subsequent observations and calculations fully confirmed his hypotheses. The general result of his researches was to facilitate astronomical prognostication, but even though his predictions were borne out by subsequent observations, he received little credit for his 'laws' until Newton demonstrated their perfect correspondence with generalisations obtained from a study of the laws of gravity. An attempt by

Central Provinces and Berar, autonomous prov. of India occupying the N. of the Deccan and lying between the Nerbudda and the Godavari Rs. It is bounded on the N. by the Central India States, on the S. by Hyderabad, on the E. by the states of Madras and Behar and Orissa, and on the W. by Bhopal, Indore, and the Khandesh dist. of Bombay. The prov. is divided into five main divs.: Jubbulpore, Nerbudda, Nagpur, Chhatisgarh, and Berar. There are also fifteen feudatory states. Originally a part of the Mahratta kingdom of Nagpur, the dist. became a prov. of Brit. India in 1861. In 1902 Berar, which had been under Brit. rule since 1853, when its ruler, the nizam, relinquished it in payment of arrears of debt, was leased to Britain in perpetuity and amalgamated to the prov. A small part of the prov. was transferred to the new prov. of Orissa in 1936. The C. P. and Berar have a total area of 99,876 sq. m. (C. P. alone, 82,150 sq. m.) and a pop. of 15,472,000. The feudatory states are 13,082 sq. m. in area, and have a pop. of about 2,000,000. The prov. falls naturally into five areas: the central plateau region, which includes the forested heights and fertile, alluvial valleys of the Saptara Range; the Nerbudda valley to the N.E., an area largely devoted to the production of wheat and pulses; the Maratha plain to the S., in which is included Berar, and of which cotton is the staple crop; the Chhatisgarh plain—the valley of the Mahanadi—in the W., where rice and pulses are grown; and the hilly Chota Nagpur area in the N.E. The chief rvs. are the Nerbudda, the Mahanadi, the Tapti, the Wardha, and the Wain-ganga. The climate of the prov. is on the average cooler than that of most parts of India. The clemency of the weather and the healthy nature of the country are due to the rainfall, which is more abundant than in N. India, and occurs regularly in June. Nagpur (pop. 215,000), the cap. of the prov., is the centre of a cotton-spinning and weaving industry; Jubbulpore is another tn. of importance. The prov. is rich in coal, and the chief mines are at Warora and Mopani; manganese is also mined. Berar is purely agric. It is very fertile and yields cotton, millet and oil seeds. The railway systems of the prov. are the Great Indian Peninsula and its branch lines, the E. Indian, the Bengal-Nagpur, and the Indian Midland, but large tracts of the country are still without railway communication. The chief exports of the C. P. are cotton, wheat, linseed oil, rice, and hides. Five-sixths of the inhab. are Hindu, but there are considerable numbers of animist Gonds (aborigines) and some Moslems. A univ. was estab. at Nagpur in 1923, and there are affiliated colleges in Nagpur, Jubbulpore, and Amraoti. The natives are slow to adopt W. civilisation.

Centranthus, European and Mediterranean genus of Valerianaceæ, is represented in Britain by *C. ruber*, the red spur-valerian. It grows to a height of

1 or 2 ft., has a sweet scent, and is cultivated as an ornamental plant. The corolla has a spur in which honey is secreted, and only one stamen and one carpel are developed. *C. calcitrapa* is a native of the coasts of the Mediterranean and of temperate France.

Centrarohidae, or **Sunfishes**, family of perch-like fishes which inhabit fresh water of N. America. The species, of which about thirty are known, are compressed and somewhat oval in body and have a spot on the operculum. Most of them build nests, all are voracious, and many are valued as food. The genus *Micropterus*, which comprises the black bass, is found in Europe.

Centre, point which is equidistant from all points on the bounding lines or surfaces of a figure. Such a fixed point can only exist in a circle or a sphere, and the equal lines which may be drawn from the C. to the boundary are called radii. Irregular figures and solids, however, have a fixed point which is called a centroid (*q.v.*), or C. of mass. This point is such that the moment of the whole figure in any plane is the same as if the whole mass were collected at that point. If a figure is so regular that circles may be described within and without touching different points at regular intervals, the C. of such circles is often referred to as the C. of the figure.

Centre, Canal du, important canal in the dept. of Saône-et-Loire, France, joining the Saône and Loire. The canal is 75 m. long, stretching from Chalon-sur-Saône to Digoin, and serves the industrial region of Le Creusot and Montceau-les-Mines. It was constructed in 1781.

Centre-board, nautical device used to prevent a boat making too much lee-way by offering greater oblique resistance to the current. The device is used in small speed-boats, yachts, and other racing skiffs. The board consists of a movable keel which swings on a pivot and is lowered at pleasure through a slot in the bottom of the boat. Vessels with wall sides can acquire keel depth by means of a lee-board.

Centre of Gravity, fixed point in a body through which the resultant of the gravity-forces acting on all the molecules of the body may be said to act. From the earliest times it had been vaguely recognised that an attraction existed between all material particles, but it was Newton who estab. the fact that the tendency of bodies to fall to the surface of the earth was part of the general law of universal attraction. Owing to the great mass of the earth, it is extremely difficult to demonstrate on the earth's surface the existence of any gravitational force other than that in which the mass of the earth is an overwhelming factor. Every particle, therefore, tends to fall in a direction which we call *vertical*, that is, towards the earth's C. of G. The vertical line at any point of the globe may be determined by the use of the plumb-line, which consists of a weight attached to the end of a string. A force acts upon every particle composing a body in a

vertical direction; the directions of all the forces on all the particles will, therefore, be parallel, and a point can be found through which the same effect can be produced by a force equal to the sum of all the little forces. This point is called the C. of G. In the case of a sphere or circle, the C. of G. is the geometrical centre, in a cylinder it is the middle point of the axis, in a triangle it is situated on the line which joins the vertex to the middle point of the opposite side and at a distance from the vertex equal to two-thirds of that line; in each of these cases it must be supposed that the material is equally dense throughout. To determine the C. of G. of a body experimentally, it should be suspended from one point and allowed to hang freely; the C. of G. must then be in the vertical line passing through the point of suspension, otherwise the body would rotate by reason of a greater force acting on one side. By choosing another point of suspension a second vertical line may be established, in which the C. of G. is situated, and the point of intersection of these two lines will give the required centre. As the action of gravity can be reduced to a single vertical force acting at a single point, equilibrium depends on the relative positions of this point and the points at which a body is supported. If the body is supported at one point only, that point requires to be in the same vertical line as the C. of G. to establish equilibrium. If the body is supported on or from a number of points, the vertical line from the C. of G. requires to fall within the figure traced out by joining those points by straight lines. The broader the base, therefore, the more *stable* is the equilibrium, for the body may be tilted to a greater extent without bringing the line of gravity outside the base; so that the body when released simply resumes its former position. A body is said to be in *unstable* equilibrium when the slightest disturbance of position results in its toppling over, such as a stick balanced on the finger; in this case the vertical line through the C. of G. does not pass through the point of support if the stick is moved. If a body is moved to an adjacent position and still remains in equilibrium it is said to be *neutral*; a sphere is an example; however it is moved, the C. of G. is always vertically above the point of support.

Centre of Gyration, that point in a rotating body at which the total mass of the body may be supposed to be concentrated. Gyration is rotation about a fixed line, called the axis of gyration, and the inertia of the body acts as a resistance to any change in the angular velocity of the body with regard to the axis of gyration. The resistance depends upon the distribution of the mass, and it is possible to conceive of the whole mass being located at a single point so that the resistance is unaltered.

Centre of Oscillation, that point in a suspended body at which the whole mass of the body may be looked upon as concentrated in order that the time of oscillation

may be the same. A simple pendulum consists of a heavy particle suspended by a fine thread from a fixed point, about which it oscillates. Such a pendulum does not exist in practice, and it is usually convenient to use a rigid rod terminated by a heavy mass. The different points in this system will strive to complete their oscillations in different times, owing to their varying distances from the point of suspension. They must, however, all oscillate together; and it follows that the motion of particles near the point of suspension will be retarded, while that of the more distant particles will be accelerated. Between these points it will be possible to fix upon a point where the motion is neither accelerated nor retarded, and the distance of this C. of O. from the point of suspension is the length of the pendulum. It has been found that the point of suspension and the C. of O. are mutually convertible, so that the C. of O. may be found experimentally as that point at which the pendulum must be suspended in order to produce the same time of oscillation as when the pendulum was suspended at its first point of suspension.

Centre of Percussion, that point in a body moving round a fixed axis at which it may be struck without producing any shock at the axis. If a body free to move be struck instantaneously in a direction which does not pass through the centre of mass, it is made to rotate about some other point in the body, whether that point is fixed or not. That is to say, that point is neither carried forward in a direction parallel to that of the blow, nor has it a reaction in the opposite direction. The two points, the C. of P. and the centre of rotation, are mutually convertible, and in fact stand in the same relation as the centre of oscillation and the point of suspension of the body considered as a pendulum. A cricket bat swung to meet a ball at its C. of P. does not communicate any shock to the axis by reason of the impact, but a shock is felt if the obstacle is met at a greater or smaller distance.

Centre of Pressure, that point in a surface pressed by a fluid at which the whole pressure exerted by the fluid may be counteracted by a single force equal to the whole pressure. If a plane surface is immersed horizontally, the C. of P. corresponds with the centre of gravity, but not if it is immersed in any other direction. If a rectangle be immersed vertically with one side in the surface, the C. of P. is at a distance of two-thirds of the vertical side below the surface. The term is used with reference to plane surfaces only, since it is not always possible to represent the pressures on a curved surface by a single force.

Centrifugal and Centripetal Forces are those called into play when a body is constrained to move with uniform velocity in a circular path. According to Newton's law a body will continue to move with a constant velocity in a straight line unless acted upon by external forces. If we wish the body to take up a circular path, a force must be applied perpendicular to the direction of motion and

equal in magnitude to the product of the mass into the square of the velocity divided by the radius of the circle. The direction of the force is towards the centre of the circle and considered in this light is a centripetal force. If we consider that the body tends to move away from the centre, the force with which it does so is called the centrifugal force. The two terms are really two names of the same thing considered in different aspects. The motion of the body when the force is removed will be along the tangent to the circle at the point where the body leaves it. The centrifugal force is an important quantity, and has many applications. Thus in the case of an engine governor there are two balls hung on rods fixed to a vertical rotating shaft, which rods can move up and down in a vertical plane, being hinged at the top end. Then when the shaft rotates the knobs tend to get away from the shaft and so are lifted up. This lifts up a valve-cap and allows steam to escape when the rotation is too rapid. The outlet of steam decreases the rotation of the shaft, lowers the balls, and closes the valve so that the pressure of steam and rotation of the shaft are kept fairly constant. Centrifugal drying machines act on the principle that the moisture clinging to the material is apparently forced out by virtue of the centrifugal force acting upon it when set in rapid motion, but, more strictly speaking, this moisture tends to go in the direction of its own motion, and so leaves the fixed material behind. Similarly in separators for various operations. The centrifugal force on a body is proportional to its mass, so that dense bodies will tend to move to the outer radius of a cylindrical vessel rotating about its axis, and lighter substances tend to move in towards the axis. In the design of fly-wheels, and all rapidly rotating wheels, the centrifugal force is an important consideration. With heavy rims moving at big velocities the force becomes enormous, and if the tensile strength of the metal does not exceed the tension caused by the force, disastrous results are caused by the wheel flying to pieces.

Centring, or Centering. When arches are being made it is necessary to support them in order that they shall not come to pieces before the mortar is set and equilibrium obtained. This is done by making a framework of wood called a centre of the required curve along its upper edge, upon which the brick or stone can rest and be built up. In the case of arches of small rise, such as those above the reveals of a window, the centre can be shaped from a single board or two boards, which are held in position by means of supports nailed into the jambs of the opening. This can only be done if the soffit is of small thickness: for larger ones a semi-circular frame is made with strips crossing the top. For larger arches with a big rise a complicated structure of wooden pieces must be built up to the required shape and of such a form that stresses in the members are of safe values when the load is applied. Thus the ribs, as they are called, should be kept in compression if possible, and for

extra large arches this compression must not be large enough to cause bending and thus displacement of the arch. The removal of the centre is done gradually so as to let the arch take up its proper form.

Centrisous, name given by Cuvier to the typical genus *Macrorhamphosus* of the family Macrorhamphosidae. *C.* (or *M.*) *scolopax*, the trumpeter, bellows-fish or sea snipe is common to the Mediterranean, and is sometimes taken on Brit. coasts.

Centroid is analogous to centre of gravity, but in its determination we leave out consideration of mass and consider distance only, so that the C. of the body of uniform density will coincide with its centre of gravity. Thus in a system of points (separate or forming an area) the C. is situated at a distance from three co-ordinate planes equal to the average distance from those places of all the points in the system.

Centrolophus, genus of deep-sea fishes of the family Stromateidae and suborder Percosoces. *C. niger*, the black fish, and *C. britannicus* have occasionally been found on Brit. coasts.

Centronotus, or Pholis, genus of spiny-rayed fishes of the Blenniidæ, or blenny family. The species are littoral, and *C. gunellus*, the butter-fish, is Brit.

Centropomus, genus of perch-like fish of the Serranidae, or sea-bass family. *C. undecimalis*, the sea-pike, which tenants the mouths of great rivers of S. America, weighs about 25 lb., and is used largely for food.

Centropristis, genus of spiny-rayed fish of the Serranidae, or sea-bass family, of which sev. species appear on the coasts and in the rivers of America. *C. nigricans*, the black perch or black bass, is abundant in N. Amer. rivers, and is much esteemed for the table.

Centumviri, court of plebeian judges in ant. Rome, the number of which varied from 100 to 180. Sometimes the court sat as a whole body under the presidency of a prætor, but on occasions it sat in sections (*consilia*). Their power of jurisdiction extended in the first place to matters of status and quiritian ownership, but latterly it was confined mostly to questions of succession. The special sign of quiritian ownership was a spear, and therefore one was always erected in front of their court.

Centunculus, small and insignificant genus of Primulaceæ which flourishes in temperate and sub-tropical countries. In Britain it has one native species, *C. minimus*, the bastard pimpernel, a small plant with pink flowers.

Centurion, Rom. officer on foot. The three prin. divs. of the regiment or legion were the Principes, the Hastati, and the Triarii, and they each elected twenty Cæ., two of whom were appointed to each of the thirty companies of foot into which the legion was divided. The first C. chosen was always a member of the council of war.

Centuripa, Centuripa, or Centorbe, tn. in the prov. of Catania, Sicily. The tn. is situated at the foot of Mt. Etna between the Simeto and the Salso, and is

about 30 m. N.W. of Catania. In ancient times the Ln. was one of the most important possessions of the Siculi (see *Cicero, Terr* (2nd oration), iii., iv., and v., *passim*, and *Plin.* iii. c. 8). The Emperor Frederick II. sacked the fn. in 1233. There are sulphur mines in the vicinity. In the Second World War the church of the Immacolata suffered damage in the Sicilian campaign. Pop. 12,200.

Ceorl, A.-S. word used to denote a freeman who held the position above a serf, but below the noble or thegn. The position of the C. was precarious; occasionally by signal service he was promoted to the rank of thegn, but more often through stress of circumstances he became identified with the serf. After the coming of William the Conqueror and the estab. of Norman feudalism in England, the C. disappeared as a unit of a definite class, and a corresponding position was occupied by the newer order of villeins.

Ceos, now called **Zea**, an is. in the Aegean Sea. It is one of the Cyclades, and noted principally for its lovely climate and its fertility. The length is 13 m. by 8 m., and it covers an area of about 40 sq. m. The bp. of the poet Simonides. Pop. 5000.

Cephaelis, now sometimes included in the genus *Uragea*, belongs to the family Rubiaceae and flourishes in S. America. C. (or U.) *ipecauanha*, which grows in damp, shaded parts of Brazilian forests, is a herb from the roots of which the drug *ipecauanha* is obtained.

Cephalanthera, genus of N. Orchidaceae, of which three species (helleborines) are Brit. *C. mandiflora*, *C. rubra*, and *C. ensifolia* are all leafy plants with rhizomes, a rudimentary rostellum, and an unsprued labellum.

Cephalanthus, genus of Rubiaceae common to Asia, Africa, and America. *C. occidentalis*, the button-wood, is a shrub which grows to a height of 6 to 15 ft., and has a light spongy wood. The root contains an agreeable bitter used as a remedy for coughs.

Cephalaspis, curious genus of fossil ostracoderm fish found in the Old Red Sandstone of Scotland and the Upper and Lower Devonian of Canada and Britain. The species had elongated bodies, large heads covered with a bony shield, a median spine, a single dorsal fin, and the anal fin was heterocercal like that of a shark. They had no jaws, and the skeleton is thought to have been cartilaginous as it has not been preserved. *C. Lyellii* and *C. Lloydii* are Brit. species, and *C. magnifica*, the largest Cephalaspid, occurs in the Cuthliss Flagstones.

Cephalæmatoma, term used in medicine to denote a tumour or swelling due to the extravasation of blood beneath the pericranium. It is only observed in newborn infants, and is produced by pressure during labour, which causes a tearing of the periosteal tissues. There is no need in most cases to do anything with a swelling of this kind, as absorption generally occurs and the C. disappears.

Cephalochordata, group of vertebrates, or primitive representatives of the verte-

brates, which is classed immediately below Pisces, or fishes. It consists of only about ten species comprised in the single genus *Amphioxus* (q.v.). There is no actual backbone, but a notochord is present, around which the backbone is constructed in the true vertebrates. The notochord extends forwards to the extreme anterior end ('head'), whence the name C. is derived.

Cephalodiscus, curious animal about the classification of which there has been some disputation among zoologists. It was first discovered in 1876, when the members of the *Challenger* expedition were dredging in the strait of Magellan, but later it was found in sev. other seas. It was originally believed to be related to the Polyzoa, but is now generally classed with *Balanoglossus*, and *Rhabdopleura* has been placed with it among these worm-like creatures which bear signs of approximating to vertebrate structure. The C. is colonial, and lives with other individuals in a branching, weed-like investment which may measure as much as 9 in. by 6. The body, like that of *Balanoglossus*, is divided into a proboscis, collar, and trunk; two gill-slits are present and a notochord is represented by a diverticulum of the alimentary canal. All these animals comprise the *Hernichordata*, allied to the *Cephalochordata* (q.v.).

Cephalonia, or **Kephallenia**, place mentioned in the *Odyssey* under the name of Samos (Samo). It is the name given to the largest of the seven Ionian Isles lying to the W. of Greece and opposite the entrance to the gulf of Lepanto. The length is 32 m. by a breadth from 5 m. to 12 m., and has an area of 300 sq. m. The coastline is very broken, and the surface is mountainous. The highest point is Elato, or Monte Negro (anc. Gk. *Ávros*, Lat. *Ænos*) (5215 ft.). The vine and currant are grown extensively, and wheat, oil, and fruit are the chief exports. The chief fn. is Argostoli. Pop. 67,000.

Cephalopoda (Gk. *κεφαλή*, head, *πους*, foot), to which belong the octopods, cuttlefishes, and squids, are the most highly specialised molluscs, and are characterised by the well-marked head, round which are arranged symmetrically 'arms' bearing suckers or tentacles, formed from the foot, as is the funnel through which water is squirted. The mantle-cavity contains four ctenidia (gills) in the Tetrabranchiata, two in the Dibranchiata, and in both orders the median anus, ink-sac, paired kidneys, and genital duct open into it. The anct. forms had external shells, and though these may be seen fossil as belemnites and ammonites, they have persisted in only one living genus, the *Nautilus*. The eyes are very large, those of one species measuring 15 in. across; the mouth has a parrot-like beak and on the tongue there is a rasping ribbon; the sense of touch is highly specialised in the arms. The cephalopods are all marine, voracious animals which feed on animal matter, especially on Crustacea; they can swim in a horizontal position or creep by means

of their arms, and they project themselves backward swiftly by a contraction of the mantle. The ink-sac is a gland which opens into the rectum, and contains a dark brown fluid in which is sepia; when alarmed the creature can expel this fluid and darken the surrounding water so as to cover its disappearance by a kind of 'smoke screen.' Among the *C.* the sexes are always distinct, a characteristic not common among molluscs, and the female is usually larger than the male. The eggs are large and are attached in masses, called sea-grapes, to bodies in the sea, and immediately on hatching they present the appearance of a diminutive adult. The *C.* are divided into two orders, the *Tetrabranchiata* and *Dibranchiata*, according to the number of their gills. In



CEPHALOPODA: COMMON OCTOPUS

the former order there are four, and the species are characterised by having no ink-sac, a well-developed external shell, a funnel composed of two unfused lobes, four kidneys and auricles, and numerous arms without suckers. *Nautilus* is the single living genus of this order, but several are found fossil, the commonest being *Ammonites*. The *Dibranchiata* have two gills, and the species are usually furnished with an ink-sac; there is no external shell, the lobes of the funnel are fused, the kidneys and auricles are two in number, and there are either eight or ten sucker-bearing arms. When there are eight arms and two tentacular arms these molluscs are known as *Decapoda*, and have an internal shell, e.g. fossil *Belemnites*, or the living *Sepia*, the cuttle-fish (of which the internal shell, or cuttle-fish 'bone' is sometimes suspended in parrot cages); when there are only eight arms, the creatures are *Octopoda* and have no shell, e.g. *Octopus*, the poulpe or octopus, and *Argonauta*, the paper-nautilus. The reproduction of *C.* is remarkable in that one of the arms of the male becomes charged with sperm and is used as a copulatory organ; in some species (e.g. the *Argonaut*) this arm is much modified ('hectocotylised') and is left behind in the

body of the female, where it was described by Cuvier as a parasite. Some deep-sea species of *C.*, such as those observed by Beebe in his bathysphere, are enormous in size, being amongst the largest of known animals.

Cephalotaceae, smallest possible family of dicotyledons, as it contains a single genus consisting of a solitary species, *Cephalotus follicularis*. This plant, popularly known as New Holland pitcher plant, grows in the marshes of W. Australia, and is very closely related to plants of the order Saxifragaceae; it has a pitcher which closely resembles that of *Nepenthes* in structure and in the function of insect-catching. The flowers are hermaphrodite, apetalous, perigynous, with six perianth leaves, stamens in two whorls of six, a gynaeceum, consisting of six free apocarpous carpels each with a single basal ovule. The fruit is a one-seeded follicle. The family differs from the Saxifragaceae only in the free, apocarpous carpels and basal ovules. The upper leaves of the plant are flat and green, while the lower leaves are those which bear the pitchers and have lids.

Cepheus, king of Ethiopia, son of Belus, husband of Cassiopeia and father of Andromeda. He was one of the heroes in the voyage of the Argonauts, and was changed into a constellation after his death. (See Ovid, *Met.* iv. 669, and v. 12.)

Cepheus, in astronomy, a constellation of the N. hemisphere, surrounded by Cassiopeia, Ursa Major, Draco, and Cygnus. It is mentioned by numerous ancient authors, including Eudoxus and Aratus, but considerable diversity appears as to the number of stars it contains. Tycho naming eleven, Ptolemy thirteen, and Hevelius fifty-one. The prin. star, Alderamin, is of the third magnitude, while Delta Cephei is an interesting double star.

Cephisus (Cephius) (Gk. Κηφισός): 1. One of the largest rivs. of Attica (Podoniphti or Sarantaporos), flowing S. through the olive-grove W. of Athens into the bay of Phaleron (near Eleusis), E. of Piræus. It rises on the slopes of Mts. Pentelicon and Parnes, and is constantly fed by their springs. 2. Also a riv. flowing through Phocis and Boeotia towards the bed of the anct. Lake Copais (Topolias). Now called Mavronero, it empties into the channel of Eubœa. Its waters are drawn off in drainage canals.

Cepheu, see KHAFFA.

Cephus, genus of hymenopterous insects of the family Cephidae (stem sawflies), which have no waist and live on plants. The females lay their eggs in stems or twigs and the white larvae eat their way through and thus frequently are very destructive. *C. integer* is an Amer. species which feeds on willow, and *C. pygmaeus* a European species which lives on corn.

Cepola, typical genus of perch-like fishes of the Cephelidae, or bandfish family. The species are all marine and inhabit European seas; *C. rubescens*, the red bandfish or red snakefish, is a Brit. species which grows to an average length of 12 in.

Ceram, Zeram, Serang, or Ceiram, is. of the Moluccas, Dutch E. Indies. It is situated to the N.E. of Amboyna, and is divided by the isthmus of Taruno into Great and Little C. Very little is known of the interior of the is.; a chain of mts. crosses it, the chief height being Nusa Keli (11,000 ft.). The land is fertile, and sago is largely grown. The exports are timber, iron, dried fish, edible nests, and birds of paradise. Area about 6605 sq. m. Pop. 98,000.

Cerambycidae, or Longicorns, family of coleopterous insects which have elongated bodies, long antennae with their insertion much embraced by the eyes, five segmented tarsi and no rostrum. The species live on trees and herbaceous plants, and the larvæ are soft, whitish grubs, usually without legs. More than 12,000 species are known, and many of them greatly damage trees, e.g. *Saperda populea*, which attacks the aspen, and *Elaphidion villosum*, the oak.

Ceramics, technical name for the study of the art of pottery in its widest sense, though pottery nowadays tends to designate only the coarser articles manuf. from clay, and porcelain is used to denote the finer articles. See POTTERY.

Ceramium, genus of marine algae belonging to the order Ceramiales. It consists of delicate filamentous seaweeds, with the tips of the filaments incurved and a cortical band at the nodes. *C. rubrum* is a common species.

Ceramius, genus of the hymenopterous family Masariidae, is related to the true wasps of the family Vespidae. The forewings of the species are flat, their antennae clubbed, and their homes are usually underground cells.

Ceram Laut Islands, group of little is. belonging to the Malay Archipelago, and one of the Molucca group. These is. are situated S.E. of Ceram, the chief one being mountainous.

Cerapus, genus of amphipodous crustaceans, is shrimp-like in general figure, but the first pair of limbs are small, and the second constitute strong pincers; the antennae are strongly developed. *C. tubularis* lives in a small cylindrical tube and exposes only the anterior part of its body. The species occur in abundance in N. America.

Cerargyrite, otherwise called **Chlorargyrite, or Horn-silver**, mineral found in S. America and Australia. It is a form of silver chloride, containing 75 per cent silver and 25 per cent chlorine. It is remarkable for malleability and sectility, and is blackened by light.

Cerasin, solid tasteless insoluble body obtained from cherry-tree gum. The soluble part of the arabin (constituting the chief part of gum-arabic) is dissolved out by digesting with water and C. remains. When C. is heated with nitric acid it yields mucic and oxalic acids.

Cerastes, genus of vipers found in W. Asia and N. Africa. The males, and sometimes the females, have a horn-like process over the eyes, and this feature is responsible for the name of the species *C. cornutus*, the horned viper. The other

species, *C. ripera*, has no horns and is said to have been the asp of Cleopatra.

Cerastium, genus of Caryophyllaceae, the representatives of which are called mouse-ear chickweed in Britain. The species contain no valuable properties and are quite un-ornamental.

Cerasus, name which Tournefort gave to a genus now usually included in *Prunus*, which belongs to the Rosaceae. It was used to distinguish cherries from such fruit as plums, and it was divided into the true cherries, bird-cherries, and cherry-laurels. *C. vulgaris*, the common cherry, is identical with *P. Cerasus*; *C. Padus*, the common bird cherry, with *P. Avium*; *C. laurocerasus*, the broad-leaved cherry laurel, with *P. laurocerasus*; *C. Lusitanica*, the Portugal laurel, with *P. Lusitanica*. See PRUNUS.

Cerasus, colony on the S. shore of the Black Sea. The colony gave the name to the cherry, a fruit which grew abundantly in the region. The colony was originally founded from Sinope.

Ceratina, genus of solitary bees which belongs to the group Scopulipedinæ of the family Apidae, or Anthophila. Unlike most bees, the Ceratina has very little hair on its body, and like the carpenter-bee of the same group it bores in wood for its home. *C. cerulea* is not uncommon in Britain.

Ceratites, genus of fossil mollusc of the order Ammonoida. *C. nodosus* is a good example.

Ceratodus (Gk. *κερας*, horn; *ὄδον*, tooth), name given to a genus of diploid fishes only a few of which are still in existence; many species, however, have been found fossil. The body is long, compressed, covered with large, thin scales, there are two teeth in one jaw, and the species have only one lung. They are found in the Trias and less seldom in the Jurassic and living examples occur in the mud-fish of Queensland rivers. *C. forsteri* is commonly called the barramunda.

Ceratonía Siliqua, sole species of its genus in the Leguminosae, and is known by the name of carob-tree. It is found wild in the countries skirting the Mediterranean, especially in the Levant, and is almost the only tree of Malta. The pods, called algarroba, or St. John's bread, contain a sweet nutritious pulp and are used for consumption by human beings and domestic animals. They are said to be the tree which yielded the honey eaten by St. John the Baptist, and the seeds are supposed to have been the original of the carat weight.

Ceratophyllaceae, small and obscure order of dicotyledonous, aquatic plants, comprehends the single genus *Ceratophyllum*, comprising three species. The flowers are dichous, the males consisting of about six to twelve stamens and as many perianth leaves, and the females of sev. perianth leaves and a single free carpel; there is one ovule and the fruit is an achene.

Ceratophyllum, sole genus of Ceratophyllaceae (q.v.) is represented in Britain by *C. demersum*, and *C. submersum*, the hornworts. They are found submerged

in ponds and ditches as rootless plants with much-divided leaves, the old leaves being horny and giving them their popular name.

Cerbera, genus of Apocynaceæ, flourishes in S. India, Ceylon, and Madagascar. *C. langhin* has a fruit from which the langhin poison is procured; it was formerly used in trials of persons convicted of crime, their guilt being estab. if it took effect, their innocence if they survived.

Cerberus (Gk. Κερβερος), name of the dog who guarded the infernal regions in Gk. mythology. Described in the poets as many-headed (Hesiod, *Theog.* 311; Homer, *Virgil*), he is usually represented with three or two heads, and a tail or mane of serpents. He only attacked those who tried to escape from Hades. It was the twelfth labour of Hercules to bring C. up from the lower world. Hevelius gave the name also to a N. constellation.

Cerberus, genus of Colubridæ, belongs to the sub-family Homalopsine, and consists of viviparous, aquatic snakes common to the rivers and estuaries of the E. Indies from Bengal to N. Australia. *C. rhynchops* has large ventral scales, and none of the species is fatal to man.

Cercamon (fl. 1100) famous Provencal troubadour, b. in Gascony. A *tenso* and three of his amorous lyrics survive, but the *pastorelas*, of which mention is made by his old biographer, is lost. Marcarun, a poet of great originality of thought and style and whose historical poems date from 1135 to 1148, was a pupil of C. See F. Diez, *Die Poesie der Troubadours*, 1827, and *Leben u. Werke der Troubadours*, 1829 (later eds. by Bartsch, 1883 and 1882 respectively).

Cercaria, scientific name applied to many young Trematodes in the genus *Distomum*, or liver-fluke. They bear considerable resemblance to the adult form, but possess a long, motile tail, frequently have eyes, and the generative organs are only rudimentary. When the eggs of a *Distomum* hatch, the larvæ search for a host, e.g., water-snail, and when the C. stage is reached in the host's body they wriggle out of it, swim to another host or foreign body, lose their tails, and encyst. In this form they may be eaten by a vertebrate, e.g. sheep, when they become mature and the larvæ once more continue the cycle.

Cercis, genus of leguminous plants, flourishes in Europe, Asia, and America. *C. Siliquastrum*, the Judas tree, so called from the tradition that the false disciple hanged himself upon one, flowers in the open air in Britain. In colour they are a bright pale red, and in the spring they burst out before a leaf appears.

Cercopithecidae, one of the two families of Catarrhine Apes, is to be found only in the Old World. The dentition is the same as that of the Simiidae, the inter-nasal septum is parrow, the tail is never prehensile, cheek pouches may or may not be present, and ischial callosities are to be seen. The genera are divided amongst the two sub-families Cercopithecinae, e.g. macaques, mandrill, green monkey, and

Sennopithecinae, e.g. guerezas, langurs, or holy apes, and proboscis monkey.

Cercopithecus, or **Guernons**, is a genus of Old World monkeys, which have long tails, ischial callosities, cheek pouches, and are often brightly coloured, e.g. *C. callitrichus*, the green monkey. *C. diana*, the Diana monkey, has a white beard.

Cercyon, son of Poseidon, or Hephestus, and the king of Eleusis. He was a cruel tyrant, put to death his daughter, Alope, and killed all strangers whom he overcame in wrestling. He was ultimately conquered and slain by Theseus.

Cerdu, **Juan Luis de** (1560-1643), Sp. author and theologian, b. and educated at Toledo, where he spent the greater part of his life. He entered a Jesuit order and was made prof. of theology and belles-lettres. He is principally famous for his able commentaries on Virgil's *Bucolics* and *Georgics* in 1608 and on the *Æneid* in 1612. He also ed. the works of Tertullian in 1624.

Cerdagne, W. part of the prov. of Roussillon in France during the fourteenth and fifteenth centuries. The name is now applied to the land on the N. and S. of the Pyrenees, partly in Spain (Catalonia) and partly in France (dept. of the Pyrénées-Orientales). From its broad valley the R. T6v flows to France, and the R. Segre to Spain.

Cerdic (d. 534?), was king of the W. Saxons and the ancestor of all the kings of England except Canute, Hardicanute, two Harolds, and William the Conqueror. It is said that he was the ninth descendant from Woden, and he landed probably in Hampshire in the year 495. He allied himself with Æse and Ella and defeated the Britons on many occasions. In 519, with Cynric, he founded the kingdom of the W. Saxons. In 530 he conquered the Isle of Wight.

Cereals, **Cereal Grasses**, or **Cerealia**, form a group of gramineous plants which are cultivated for their edible seeds: the name is derived from Ceres, the corn-goddess of classical mythology. Botanically speaking the term has no definite limits, for the species of some genera are often cultivated for their grain, while their near allies are of no importance as food. The plants have been grown from the earliest times, and frequently the wild form from which they have sprung is unknown, as in the wheat and barley. The C. which are best known to the human race are wheat or *Triticum*, barley or *Hordeum*, rye or *Secale*, oats or *Avena*, Indian corn (maize) or *Zea*, millet or *Panicum* (also *Sorghum*, *Setaria*, *Pennisetum*), and rice or *Oryza*.

Cerebral Softening, see under **BRAIN**, *Diseases of the Brain*.

Cerebration, **Unconscious**. It is certain that all conscious mental processes are accompanied by molecular changes in the cerebrum (see *Function of the Brain*, under **BRAIN**). Sir W. Hamilton and Dr. Carpenter believe that these changes in the brain may go on without accompanying conscious action. As an example of this, we may take the ordinary experience of suddenly recalling a name or an

incident while in the midst of some entirely different line of thought, after having been unable to recall it while thinking definitely of it. According to Dr. Carpenter, the cerebrum, after being put in action by the consciousness, goes on working automatically. This may perhaps be regarded as the physiological interpretation of the psychological statement that the mind may undergo modification without being conscious of the processes involved. See Sir W. Hamilton, *Lectures on Metaphysics and Logic*, vol. 1., 1859-60, 1874; W. B. Carpenter, *Principles of Mental Physiology*, 1874.

Cerebro-spinal Fluid, lies between the coverings of the brain and spinal cord. The outer covering is termed the dura mater, while the inner one which follows the contours of the brain is termed the pia mater. Between these two there is a third, the arachnoid, formed of loose connecting tissue. The C. F. is contained partly between the dura mater and the arachnoid, but mainly between the pia mater and the arachnoid. It passes over all the brain and spinal cord, and acts as a carrier of waste products and as a guard against shock to either the brain or the spinal cord. It further maintains an equal pressure on the skull, being variable in quantity. It is clear, practically colourless, liquid, and very similar to lymph. It is abundant in old people, for as the brain atrophies the amount of fluid increases.

Cerebro-spinal fever, see under MENINGITIS.

Cerebrum, see BRAIN.

Ceremonies, Master of the, title reminiscent of the 'Governor of the Feast' of the N.T. In the present day it is usually applied to a person who assumes control of affairs at any social function.

Cereopsis, genus of anseriform birds of the family Anatidae, is one of the least natural of its kind. *C. Nova Hollandiae*, the New Holland or Cape Barren goose, is a handsome bird of grey-brown plumage.

Ceres - 1. Vt. in Fife-shire, Scotland, 3 m. S. E. of Cupar. Pop. 1145. 2. Dist. and tn. in Cape of Good Hope, near the Hex R. valley and 7.5 m. from Cape Town. It has a good water supply and is a health resort. Pop. of dist. 7000 of the tn. 1300.

Ceres, Rom. name of the Gk. goddess Demeter (*q.v.*).

Ceres, name given to the first discovered of the asteroids. It was first seen by Piazzi at Palermo, Sicily, on Jan. 1, 1801, and observed by him till Feb. 13. There was some danger of its being lost again, as by the time the news of its discovery reached other astronomers in March, observations were impossible owing to its proximity to the sun. The difficulty was overcome by the invention of a new method of planetary orbit computation by Gauss. It is not visible to the naked eye, being of the seventh or eighth magnitude.

Céret, tn. in the dept. of Pyrénées-Orientales, France, near Perpignan, with tale quarries, cork and shoe-making industries. Pop. 5000.

Cereus, or Torch-thistle, large genus of Cactaceae common to tropical America and the W. Indies. Most of the species are erect, the stem is elongated, angular, seldom branched, and the fruit is often edible. Some of the members of the genus bloom in the night-time, and are sweetly scented, e.g. *C. triangularis* and *C. grandiflorus*. *C. senilis*, old-man cactus, is covered with silky white hairs, and *C. giganteus* is the tallest cactus in existence, reaching a height of over 70 ft. *C. flagelliformis*, the creeping C., has thin sinuous branches, and *C. speciosissimus* is noted for its beautiful purple and red flowers.

Ceria, genus of dipterous insects, belongs to the Syrphidae, or hover-fly family. The body is elongated and somewhat ovate in form, black and yellow in colour, the general appearance is wasp-like. *C. conopsoides* is a species rarely found in Britain.

Cerignola, tn and episcopal see in the prov. of Foggia, Italy. It was near here that the Spaniards under Gonsalvo da Cordova defeated the Fr. under the duc de Nemours in 1503. Taken by the Eighth Army (*q.v.*) in Sept. 1943 in their advance to the Foggia plain. Pop. 40,000.

Cerigo (anct. Cythera), most southerly of the Ionian Isles. It is very mountainous, and covers an area of 116 sq. m. The chief tn. is Caspali which lies at the S. end. Wheat, vines, olives, and cotton are grown, and the pasture land is excellent. Sheep and goats are exported to Greece in great numbers. The is. was colonised by the Phœnicians, and was celebrated for the worship of Venus, who was said to have come up out of the sea near this spot. Pop. 16,000.

Cerinthus (c. A.D. 100), early Christian heretic, who was a contemporary with the last years of St. John the Apostle. Early accounts all seem to agree that the prov. of Asia was the scene of his work, and Hippolytus states that he had his training in Egypt. The teaching of C. was that the world had been made by angels, and the only part of the N.T. he accepted was extracted from St. Matthew's gospel.

Cerithium, gastropod mollusc, is to be found in marine, but more often in brackish, water. Like others of the family Cerithiidae, it has a long, many-whorled turreted shell, a short branchial siphon, and a horny operculum. It occurs fossilised in great abundance.

Cerium, one of the 'rare earth' metals, chemical symbol Ce. Atomic weight 140; sp. gr. 7.0; melting point 645°. It resembles iron in appearance. It is malleable and ductile and a poor conductor of electricity. Burns in air, and in the form of wire its flame is brighter than that of magnesium. The metal is prepared by the electrolysis of its fused chlorides, with the addition of a small percentage of sodium or potassium chloride with iron cathode and graphite anode. Sev. mixtures are used for making lighters. C. occurs in a number of rare minerals, one of the commonest

being monazite sand; and thorium and other rare metals contain up to 30 per cent of the oxide; much rarer, but containing some 60 per cent of the oxide, is cerite.

Cernusci (Cernuschi), Enrico (1821-96), lt. economist. *b.* at Milan; fought as a Republican (1848-49), and in 1850 settled as a banker in Paris. In 1871, having incurred the hostility of the Communards, he left France and travelled in Egypt, China, Japan, England, and America. He was an advocate of bimetallism, and his works, mainly on money questions, include *Mécanique de l'échange* (1865); *Illusion des sociétés coopératives* (1866); *Silver Vindicated* (1876); *Le Bimétallisme à quinze et demi* (1881).

Cernusco sul Naviglio, community situated 6 m. from Milan in Italy. Pop. 6800.

Cerocoma, genus of coleopterous insects of the family Cantharidae, is noted for the extraordinary antennae of the males. The Brit. species appear on flowers in great numbers during the summer months, but the larva of *C. Schnaefferi* has been found preying on the food stored in a wasp's nest.

Ceroxylon, genus containing five Amer. palms, is remarkable chiefly for *C. andicola*, the wax palm of the Andes. The plant grows to a height of about 180 ft. among the most rugged precipices of the wild region it inhabits, avoiding tropical plains; its leaves are 18 to 20 ft. long, and the trunk is covered with a thick incrustation of wax which is made into excellent candles.

Cerreto, tn. and an episcopal see in the prov. of Campania, Italy, 16 m. from Benevento. It has a very fine cathedral. In the fighting of 1943 the Gers. blew up the campanile of the Madonna del Carmine Church. Pop. 5000.

Cerro de Pasco, mining tn. and cap. of dept. of Junin, 120 m. from Callao, in the highlands of Peru. It has silver and copper mines which are extraordinarily rich, and there are therefore large smelting works. Coal and salt are also found near by. There is a railroad connection with Lima via Oroya. It stands at an altitude of 14,270 ft. Pop. 15,000.

Cerro Gordo, pass between the mts. in Mexico on the road from Mexico City to Vera Cruz and about 60 m. from the latter. The Amers. under Gen. Scott defeated the Mexicans here in 1847.

Cerro Largo, dept in N.E. of Uruguay. It has the Rio Negro on the N.W., and Brazil on the E. Large herds of cattle are pastured on the grass-covered downs. Its area is 5753 sq. m. Pop. 96,000.

Certaldo, vil. in the prov. of Tuscany, Italy, 20 m. from Florence. It is the place where Boccaccio lived and *d.* (1313-1375). The tn. was heavily shelled in the Second World War. Boccaccio's house was badly damaged, and minor damage was done to the church of SS. Michele e Jacopo. Pop. (com.) 12,000.

Certhia, genus of passeriform birds, consists of sev. species with moderately long curved bills, short wings, and stiff tail-feathers, which have large feet and

strong claws well adapted for climbing about trees and rocks. The food consists of insects and their larvae. *C. familiaris*, the tree-creeper, is an active little creature common in England, with a monotonous and often-repeated note.

Certhiidae, family of passeriform birds known popularly as creepers. The species have a long, slightly curved beak and there is a sharp claw on the hind toe; many utter shrill cries, *e.g.* *Tichodroma muraria*, the wall-creeper, but others are songsters, *e.g.* *Certhia familiaris*, tree or common creeper.

Certhilauda, genus of the Alaudidae, or lark family, of which the members dwell in arid plains and deserts. The plumage is dull-coloured, and the beak long and curved.

Certificate, in law, may comprise either (1) documents officially prepared by a court for the purpose of notifying another court, or any one whom it may thereafter concern, of anything directed or ordered in the certifying court; or (2) signed and written statements by various persons admissible as evidence of the facts certified therein. Instances of the first kind are a bankrupt's C. of discharge, a C. of conviction or acquittal on a criminal charge tried before a court of record, a C. of dismissal on a charge before a court of summary jurisdiction, and a judge's C. of costs. Instances of the second class are a public analyst's C., a C. of the registration of a Brit. ship, an alien's C. of naturalisation, an architect's C. as to the due performance of a building contract, a C. of shares in a joint-stock company constituting the document of title to the shares, and a C. of deposit given by a banker for the purpose of certifying that the person named therein has placed a certain sum on deposit account.

Certification, in law of Scotland, means the express or implied notice to the defender (defendant in Eng. law) that unless he complies with the order in a summons, or shows a reason why he is not bound to do so, certain penalties will be inflicted by the judge. The defender may by custom obtain a special C. against the pursuer (plaintiff) if the latter fails to prosecute an action after having commenced it.

Certiorari, writ issuing from one of the superior courts, directing the judges or officers of an inferior court to transmit or cause to be certified (*certiorari facias*) records or other proceedings. The object of the removal is either that the judgment of the inferior tribunal may be reviewed by the superior court, or that the decision and the proceedings leading to it may take place before the higher tribunal. The Crown office rules provide that indictments and proceedings from inferior courts in criminal matters may not be removed by writ of C. unless it is clear that a fair trial cannot be had in the inferior court, or that some question of law of unusual difficulty may arise, or that a view of the premises or a special jury in respect of which the indictment is preferred may be required for a satisfactory trial. The Central Criminal Court (*q.v.*) has a trans-

ferred jurisdiction by writ of C. from the various sessional courts within its jurisdiction. A writ of C. is demandable as of right by the Crown, but a private prosecutor must apply for leave to obtain such a writ.

Certosa di Pavia, Carthusian monastery in Italy about 5 m. N. of Pavia. This monastery was inaugurated in 1396 by Giovanni Galeazzo Visconti, duke of Milan. The front exterior of the church is very elaborately decorated, and is considered one of the finest specimens of Renaissance work in Italy. In the interior of the church are many beautiful pieces of sculpture, among which are the tombs of the founder, of Lodovico Moro and his wife Beatrice d'Este. There are also paintings by Borgognone, Solari, Luini, and others. The monks manufactured a special liqueur. The monastery was dissolved in 1866, but it was made a national lt. monument in the year 1891. It is close to this spot that Francis I. of France was taken prisoner by the Imperialists in 1525.

Cerumen, commonly known as ear-wax, is yellow waxy matter, and is secreted by certain glands which lie in the passage leading from the outer ear to the tympanum or drum. Its purpose is to catch particles of dust and other substances, and so prevent them from damaging the drum, and it further serves to lubricate the passage. Sometimes C. is formed in excess, and it then causes deafness. Oiling and syringing have in these cases to be resorted to so as to remove the wax which has become hard.

Ceruse, see WHITE LEAD.

Cervantes Saavedra, Miguel de (1547-1616), playwright, poet, and novelist, *b.* at Alcalá de Henares. His parents were fairly well to do, but were not of noble lineage. His father, an apothecary surgeon, seems to have moved about the country during the early years of C.'s life, and it is, of course, highly probable that C. went with him. From 1566 onward the family lived in Madrid. In 1569 C. contributed some poems to a memoir of Isabel de Valois, the wife of Philip II. In 1569 also we have indisputable evidence that C. was in Rome. Many theories have been put forward as to the manner of his arrival there, but the probability is that he served as a soldier in Italy and there entered the service of Acquiviva, recently raised to the cardinalate. In 1570 he became a soldier in the regular service, and in 1571 he took part in the battle of Lepanto, serving on board the *Marquesa*. He was ill of a fever at the time of the battle, but insisted upon fighting, and was thrice wounded. During the following years he saw active service at Navarino and Tunis, and served in the garrison at Naples and Palermo. In 1575 he received leave to return to Spain, and armed with letters of recommendation from those in authority he set out for home. He sailed in a ship called the *Sol*, which was taken on the voyage by Barbary pirates, and C. and his brother, together with many other Spaniards, were taken to Algiers and there sold as slaves.

C. became the slave of a man called Dal Marni and, since he was supposed to be a man of considerable importance, was somewhat closely guarded. In 1576 he tried to escape but failed, in 1577 his brother was ransomed, but the amount sent was not sufficient to pay his ransom also, and in the same year he made another attempt to escape. He was captured and brought before Hassan Pasha, the viceroy of Algiers, by whom he was bought, and who seems to have regarded the 'manned Spaniard' as a kind of mascot. C. still had many plans for escape, and his parents were indefatigable in their attempts to ransom him, and



CERVANTES

After an engraving by D. F. Selma

finally, after much difficulty, he was released and returned to Spain in Oct. 1580, reaching Madrid in the Dec. of the same year. During the years immediately following he seems to have visited Algiers and Portugal, and may possibly have been in the Azores. Between the years 1583 and 1587 he produced many plays for the stage, very few of which remain in existence at the present time. In 1584 he produced *Palat*, and in the Dec. of the same year he married. He found, however, that he could not earn sufficient with his pen, although in the matter of dramatic plays it had been exceedingly busy, and so in 1587 we find him engaged in gathering stores for the Invincible Armada. Between this date and the end of the century his fortune sank lower and lower. The work which he was doing was uncongenial, the pay was often in arrears, he was unfortunate in the men he employed, was in constant financial difficulties, and his unbusiness-like methods cost him even the pittance which he was earning. He was at least twice imprisoned during this period, and by 1600 his condition was that of extreme

poverty. He had still contributed little to literature and between 1585 and 1603 his contributions may be regarded as a negligible quantity. In 1604, however, permission was granted C. to publish *Don Quijote de la Mancha*. His work may have been read in MS. previous to this date, but it was first definitely pub. at the beginning of 1605. *Don Quijote* sprang into universal popularity almost at once. The breadth of the humanity of the book and its general philosophy did not at first strike the public mind; but its essentially natural character, its broad survey of the types of the time, and its comedy appealed at once, and the book became a huge success. Eds. of it were pirated; it was printed at Madrid, at Lisbon, at Valencia. Within six months of its pub. *Don Quijote* and *Sancho Panza* were regarded as proverbial types of character. His main object, as C. himself said, was to ridicule the romances of chivalry; the greater world-wide view of the book came only slowly and was not appreciated, because it was not seen by the greater number of his contemporaries. Even after the pub. of his great book C. would seem to have remained poor. He had also at this time a number of domestic troubles, and in 1608 we find him living in very poor circumstances indeed. In 1609 he became a member of one of the Franciscan orders, and in 1613 he pub. and sold his *Novelas Exemplares*, a book which would itself entitle him to rank as one of the greatest of Sp. writers. It consisted of twelve short stories written in his own inimitable style. Between this date and 1614 he pub. some plays and some interludes. The plays are acknowledged by himself not to be good, but in most cases the prose is good. In 1614 also appeared his most famous poem, the *Viage del Parnaso*. In 1614 was pub. a second part to *Don Quijote*, this time, however, from the pen of one Avellaneda, who in his preface taunted C. with his poverty and ill fortune, and openly acknowledged that whilst he knew that he (the author) would not stand any chance from a literary point of view in competition with C., he was determined to be the first in the market. The second part from the pen of C. was pub. in 1615, and was received with as much acclamation as had been the first. His last work, *Los Trabajos de Persius y Sigmunda*, the author did not live to see pub.; he breathed his last in April 1616, the greatest of all Sp. novelists. Before his death his *Don Quijote* had been trans. into many languages, of which the Eng. by Shelton was the first. It was destined to become one of the most popular of all books of all languages. Fielding's *History of the Adventures of Joseph Andrews* (1742) was written 'in imitation of the manner of Cervantes.' Complete works (trans.) ed. by J. Fitzmaurice-Kelly, 1901-6. Trans. of *Don Quijote* by T. Shelton, 1612, 1620; P. A. Mottaux, 1712; C. Jervas, 1742; T. Smollett, 1755; J. Ormsby, 1885. Lives by J. Fitzmaurice-Kelly, 1892 (rev. ed. 1913); A. F. Culvert, 1905. See also J. Fitzmaurice-Kelly,

Cervantes in England, 1905, and *Cervantes and Shakespeare*, 1916; S. de Madariaga, *Essay on Don Quijote*, 1935; L. B. Walton, *Cervantes*, 1948, and introduction to *Don Quijote* in Everyman's Library.

Cervera y Topete, Pascual (1839-1909), Sp. admiral and commander-in-chief during the Sp.-Amer. war of 1898. He was b. at Jerez in the prov. of Cadiz. When the war broke out, he sailed for Cuba with secret orders to defend Sp. interests. He reached Santiago on May 19, and was there blockaded by Adm. Sampson, commanding the Amer. fleet. The Amers. tried to block the harbour by sinking the *Merrimac*, but failed to do so, and on July 3 the Sp. fleet endeavoured to escape. This was done in response to public opinion, but against C.'s judgment. The result was that the Amers. captured or sunk every Sp. ship, killed a third of their crews, and C. was made a prisoner. When the war ended he returned to Spain, where he was tried by court-martial, but honourably acquitted.

Cervetri, or Cerveteri, vil. 20 m. W.N.W. of Rome. It is built in a corner on the inner side of the ancient Etruscan walls of the city Carac. The old city carried on an extensive trade and was very prosperous down to the thirteenth century. It is noted for the famous Etruscan graves, some of which are cut out of the solid rock.

Cervia, com. in the prov. of and 15 m. from the tn. of Ravenna, Italy, situated on the Adriatic. It has a beautiful cathedral. Pop. 10,159.

Cervidae, deer family, of the ruminant div. *Pecora*, is divided into the sub-families Cervine and Moschine, the latter consisting of the single genus *Moschus*, the musk-deer of Asia; sev. extinct genera are found fossil. The members of the family are distinguished by their antlers, features possessed by no other ruminants, which are present in all male deer but *Moschus* and *Hydropotes*, and in the females also of *Rangifer*, the reindeer. In the genus *Elaphodus* the antlers are devoid of any branching, but in *Cervus* there are sev. branches and there may be as many as forty-eight points. A gall-bladder is present only in *Moschus*, and in the family Bovidae (a.e.) only one genus lacks this organ; all deer have two orifices to the lachrymal duct, and only one genus of antelope has this feature; and in sev. minor points the C. may be shown to differ from the Bovidae. The sixty or so species of deer are spread over Europe, Asia, America, and part of Africa, and are totally lacking in Australia.

Cervin, Mont. see MATTERHORN.

Cervole, Arnaud de (d. 1366), also known as Archpriest. He was b. at Périgord and was a leader of the Fr. mercenary troops. He entered the service of John II. of France in 1352 and fought against the Eng., especially distinguishing himself at the battle of Poitiers in 1356. In 1357 he invaded and looted Provence and compelled Pope Innocent VI. of Avignon to pay a large sum of money. Charles V. of France made use of him in

1359 to disperse other bands, the Tard-Venus. In 1365 he gathered all his troops together on the Alsation frontier with a view of quelling the Turks, but his men were so riotous and disorderly that Charles IV. of Germany would not consent to their passing through his country. C. was murdered the following year by one of his lieutenants on the occasion of a new expedition against the Turks.

Cervus, see DEER.

Cesalpino, see CAESALPINUS, ANDREAS.

Cesari, Giuseppe (1568-1640), called Il Cavaliere d'Arpino. He was a painter in Rome of very high repute, and was the rival of Carracci and Caravaggio. His work, however, is not accurate, nor is the perspective good, but it is considered very pleasing by some. His best works were a Rom. battle picture and 'The Death of Cicero.'

Cesarini, Giuliano (1389-1444), also known as Cardinal Giuliano. He was an It. diplomatist. He learnt law at Padua, and won the favour and patronage of Pope Martin V., who conferred the title of cardinal upon him in 1426. In 1430 he was sent to Germany as papal legate to get ready a crusade against John Huss and his followers. He was present at the battle of Taus in 1431. He became president of the Council of Basle in 1431, but as his propositions were not agreeable to the council he resigned in 1438. The king of Poland, Ladislaus III., had conquered the Turks and made a treaty with them, when C. approached him as papal legate and persuaded him to go back on his word. The result was disaster. In 1444 they fought the Turks at Varna, and both C. and the king were killed.

Cesarotti, Melchiorre (1730-1808), It. writer, b. in Padua of noble but poor family. He became a prof. of Gk. and Heb. at the univ. in his native tn. in 1768, and held that position all his life. When Italy was invaded by the Fr., he wrote in defence of their cause, and Napoleon I. made him a knight of the Iron Crown, and gave him a pension. By way of expressing his gratitude he penned a very fulsome poem to Napoleon called *Prouce*. His most important original work was *Saggio sulla Filosofia delle Lingue*, which he wrote in 1785. In this he advocated a free development of language as opposed to the teaching of the Della Cruscan Academy at Florence. He also wrote a book called *Filosofia del Gusto*. His great work of translation was Macpherson's *Ossian*, done in 1763, but he produced a complete ed. in 1772. This was thought much of in Italy, and it exercised a great influence in that country and elsewhere. His introductory preface was trans. into Eng. and ed. with notes by J. McArthur in 1806. He also attempted, by way of translation, a prose version of the *Iliad*, which he followed with a long verse paraphrase running into 10 vols., entitled *La Morte d'Elttore*. In 1772 he trans. some of Voltaire's plays and Gray's *Elegy*.

Cesarewitch, see TSAR.

Cesena (anc. *Cassena*), tn. and episcopal see in the prov. of Forlì, Italy, 17 m. from

Rimini. It has a splendid Malatesta library and also a cathedral and a citadel. The people spin silk and mine sulphur, and the tn. is noted for its wine and hemp. The Fr. defeated the Austrians here in 1815. Dante alludes to its hist. in his *Inferno*. In spite of fighting in this area in the course of the Second World War there was no serious damage to any of the city's monumental buildings. The church of San Domenico had its roof damaged and the Palazzo Comunale (tn. hall) also sustained some damage. The Palazzo delle Scuole, which housed the above-mentioned library, founded in 1452 and containing some 400 valuable MSS. and incunabula, as well as the picture galleries, was unharmed. Pop. 16,000.

Cesenatico, com. and seaport on the Adriatic in the prov. of Forlì in Italy, 14 m. from Rimini. Brit. ships bombarded it in 1800. Pop. 10,000.

Cesky-Brod (Ger. *Böhmisch-Brod*), old tn. in Czechoslovakia, 20 m. E. of Prague. Pop. 4500.

Cesky Krumlov (Ger. *Krumau*), tn. of Czechoslovakia, on an is. in the Moldau, 14 m. S.S.W. of Budjovice. Manufs. include linen, cloth, paper, celluloid, hemp. There is graphite mining also. It has a fine old castle. Pop. (1921) 8200.

Cesme, Asiatic Turkey, see CHESME.

Cesnola, Luigi Palma di, Count (1832-1904), explorer, b. at Rivarolo, near Turin. He fought in the war with Austria in 1848, in the Crimean war, and in the Civil war in America he had a command with the N. army. In 1865 he was made Amer. consul at Cyprus, and while in that position he began his excavations at Dali, Curium, and Larnaca. The Museum of Art in New York bought nearly all his collection, and he was appointed its director in 1878. He brought out a book entitled *Cyprus: its Ancient Cities, Tombs, and Temples* (1877).

Cessio Bonorum, in Scots law, a system which enabled any person who was in prison for civil debt, or against whom such a writ of imprisonment had been issued, to present a petition setting forth his inability to meet his liabilities and his willingness to convey the whole of his property to a trustee for the benefit of his creditors. C. B., like the old insolvency system in England, was characterised by this important difference from mercantile bankruptcy, that the person who obtained the privilege was not discharged from his debts, but only from proceedings against his person. Since the Debtors Act, 1880, which virtually abolished imprisonment for debt, the process of C. B. is applied to sequestration (in Eng. law, 'adjudication') in minor bankruptcies, for the purpose of reducing expenses.

Cession (Lat. *cedere*, to yield), name given in international law to the formal transfer of ter. from one state to another. This may be the result of a gift, an exchange, or a sale, but is more usually due to the fortune of war, most Cs. having been exacted as the price of peace between warring nations. The consent of the people of the ceded ter. is not essential, but deference is often paid to

their wishes, except by modern totalitarian states. Their civil and political rights should be and generally have been determined by the treaty under which the C. is made. Apart from special stipulations, the citizens transfer their allegiance from one sovereignty to the other, obtaining their share in the rights of the new state, though, in recent instances of 'cession', as, e.g., in the case of Czechoslovakia and Poland, the Ger. and Russian Govts. first set up puppet govts. and then accorded the inhab. only such rights as were convenient to Ger. and Russian interests respectively. But, according to international jurists, the position is that old laws continue valid until altered by the new sovereign. Titles to property and personal relations remain unchanged. If the citizens should suffer loss of property by the C., the ceding state is not bound to indemnify them. Usually a clause in the C. treaty deals with the question of debts. As the object of C. is sovereignty over the ceded ter., all such individuals domiciled therein as are subjects of the ceding state become *ipso facto* by the C. subjects of the acquiring state. The hardship involved in the fact that in all cases of C. the inhab. of the ter. who remain lose their old citizenship and are handed over to a new sovereign whether they like it or not, revived after the First World War a movement in favour of the claim that no C. should be valid until the inhab. had by plebiscite given their consent to the C. Moreover sev. treaties of C. concluded during the nineteenth century stipulated that the C. should only be valid provided the inhab. consented to it through a plebiscite. But it seemed doubtful whether the law of nations would ever make it a condition of every C. that it must be ratified by a plebiscite. By the treaties of peace after the First World War the method of a plebiscite was adopted in a number of cases. In any case the hardship of the inhab. being handed over to a new sovereign against their will can be lessened by a stipulation in the treaty of C. binding the acquiring state to give the inhab. of the ceded ter. the option of retaining their old citizenship on making an express declaration. But it must be emphasised that, failing a stipulation expressly forbidding it, the acquiring state may expel those inhab. who have made use of the option and retained their old citizenship, since otherwise the whole pop. of the ceded ter. might actually consist of aliens and endanger the safety of the acquiring state. In many cases an option of neutrality was accorded in the treaties of peace following the First World War to the inhab. of ters. ceded under them. The terms of the option varied in each particular case; but the general principle applied was that persons habitually resident in ceded ter. acquired *ipso facto* the nationality of the state to which the ter. had been transferred, and lost the nationality of the ceding state. Nevertheless such persons, if over eighteen years of age, might opt for their old

nationality, and if they exercised that option their choice covered a wife and any children under eighteen years of age. They must, however, in that case remove themselves to the ter. of their old state (L. F. L. Oppenheim, *International Law*). See T. J. Lawrence, *Principles of International Law*, 1910; W. E. Hall (ed. Higgins), *Treatise on International Law*, 1917; J. L. Brierly, *The Law of Nations*, 1928.

Cessnock, tn., New S. Wales, 130 m. W. of Sydney. Pop. 7000.

Cestoda, or Cestoid Worms, form an order of Platyhelminthes, or flat worms, and from their elongated shape are known as tapeworms. They are all parasitic and only one genus reaches the adult stage outside the alimentary canal of vertebrates. The tapeworm consists of a head, or *scolex*, which attaches itself to the lining of the canal by suckers or hooks, and most of the species then show a long chain of segments, or *proglottides*, each of which, when separated from the others, lives as an independent animal. A few species, however, have no external segmentation, and do not break off in this way. In no species are there sense-organs, vascular system, mouth, or alimentary canal, food being absorbed by the body from the host, but there are a nervous and a well-developed excretory system. The life hist. is curious. The detached proglottides pass out of the host, and the eggs are scattered. These are swallowed by a new host in its food or drinking-water and the embryos eventually bore into the blood-vessels and are carried to the various organs. Thereupon they change into a *cystic* or *bladder-worm*, and develop a scolex, and if the animal in which they live is eaten by another the scolex passes into this final host, enters the alimentary canal, and matures. Among the vertebrates attacked by the C. are man, dog, sheep, ox, horse, hare, rabbit, squirrel, fox, pig, rat, mouse, frog, and sev. birds. *Diphyllobothrium latum* (*Bothriocephalus latus*), the largest species preying on man, may attain a length of 30 ft.; *Cenurus cerebralis* destroys many sheep, causing the disease of staggers; and various members of the genus *Tænia* are dangerous to human beings who are not vegetarian in habit. *T. saginata* is the beef tapeworm, still common in many countries; *T. solium*, the pork tapeworm, is now very rare. The bladder-worm stage of *T. echinococcus* sets up hydatid cysts in various internal organs; this species becomes adult in dogs and consequently it occurs chiefly in people, e.g. Eskimoes, closely associated with these animals.

Cestracion, typical genus of Cestraciontidae, the bull-shark family; occurs in the Pacific and E. Indies. *C. philippi* is known popularly as the Port Jackson shark.

Cestus: 1. Thongs of leather which the Gk. and Rom. boxers wore on their hands. They were not used, as are modern boxing-gloves, to soften the blow, but to make it harder, as those thongs were often weighted with iron and lead.

2. Name given to the magic belt of Aphrodite (Venus) which made everybody who beheld her fall in love with her.

Cestus Veneris, or **Venus's Girdle**, is a species of Ctenophora found in the Mediterranean and Atlantic. The body of this ctenulate is much compressed, and becomes ribbon-like in shape; it often exceeds one yard in length. *C. pectenalis* resembles it in appearance, but has a patch of orange at each end of its body.

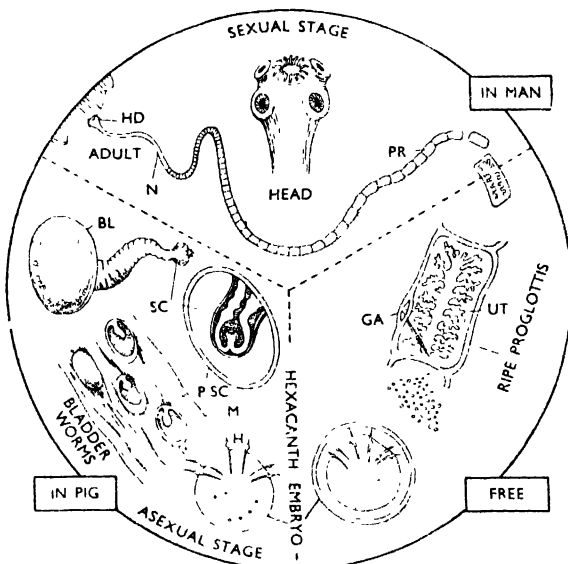
head of the animals is always very large, the nostrils are seen as a single or double blowhole placed generally far back on the skull, the bones are spongy and full of oil, teeth are few or absent, there is no collar-bone, the eyes are tiny when compared with the bulk of their owner, and there is no external ear. The females usually bring forth one at a birth; their two mammae are inguinal in position and are adapted to the function of feeding the

CESTODA (TAPEWORMS)

In man HD, head, N, neck, PR proglottids

Free-living Free proglottis and egg-cases, UT, uterus, GA genital aperture Embryo within the egg case

In pig H, hexacanth embryo, PSC, pro-scolex, M, muscle of pig; SC, scolex, BL bladder



Cetacea, large order of mammals, consisting of whales, dolphins, and porpoises, but the purely aquatic habit of its members has often led them to be classed vulgarly and erroneously with fishes. They are fishlike in form, having a tapering tail expanded into horizontal flukes which aid the creatures in their powerful locomotion, there are no posterior limbs, and the anterior limbs are converted into paddles which are unprovided with external digits. They are unlike fish in nearly all important characteristics, such as that they possess warm blood and breathe air; in connection with this feature it may here be mentioned that in spouting whales do not blow sea-water, and any water that can be seen is the condensed vapour of their breath. Among the C. a hairy covering is always absent, but it is represented usually by a very few bristly hairs about the mouth easily counted; the warmth of which they would be deprived by the absence of the covering is amply replaced by a thick layer of blubber under the skin. The

young in the water; the mother proves most devoted to her offspring. Whales are very widely distributed throughout the seas of the world, and a few are to be found in rivs. of Asia and S. America. On land they are helpless, and after being for a short time out of their native element they die, probably crushed by their own weight. In diet all cetaceans are carnivorous, their chief food being cuttlefish, crustaceans, jelly-fish, and true fishes; some even devour seals and smaller whales; the whalebone whales are said to feed on the minute animals of the surface waters (plankton). In disposition they seem gentle and docile. The minimum size of one of these animals is about 3 ft., and the maximum is the enormous length of 85 ft. Fossil C. have been found in the Eocene, Miocene, and Pliocene, and the sub-order Archaeoceti comprises a single genus, that of the extinct Zeuglodon. The two sub-orders of living C. are the Mysticoceti or whalebone whales and the Odontoceti or toothed whales. In the former div. are to be found the species

known as right whales, porquals, the grey whale, the blue whale, and the hump-back whale; in the latter occur the sperm whales, bottlenose, dolphins, porpoises, the narwhal, white whale or beluga, the killer, and the pilot whale. See separate articles for products and species. See also WHALE.

Cetatea Alba (formerly **Akkerman**), fort, tn. in Bessarabia (Rumania), near the mouth of the Dniester, and about 30 m. S.W. of Odessa. The chief industry is the raising of fruit, especially grapes, but fish and salt from the neighbouring lakes are also exported. Pop. 40,000.

Cethegus, name of a patrician Rom. family of the Cornelian clan.

Marcus Cornelius Cethegus was twice censor, in 209 B.C. and 204 B.C. respectively. He was noted for his rhetoric and correct manner of speaking. He d. in 196 B.C.

Gaius Cornelius Cethegus was one of Catiline's companions in his conspiracy of 63 B.C. He stayed in Rome intending to murder the chief senators, but Cicero arrested him and had him put to death. Is said to have been a worthless and violent man.

Cetin ($C_{32}H_{64}O_2$), fatty crystalline substance, insoluble in water, but soluble in alcohol and ether. It melts at $19^{\circ}C$. and volatilises at $360^{\circ}C$. It is the chief constituent of spermaceti, a wax found in the body of the sperm whale and other cetacea. C. is employed as an emollient, and for the manu. of candles, etc.

Cetiosaurus, genus of large fossil Dinosaurs in the order Sauropoda. This reptile was four-footed and herbivorous; its remains occur in the Middle Jura of England, but both skull and cervical vertebrae are unknown.

Cotonia, genus of coleopterous insects of the family Scarabaeidae, inhabits warm lands. *C. aurata*, the rose-chaffer, is a beautiful bright green beetle. Both larva and imago feed on vegetable substances, but *C. floricola* is said to live in ants' nests in the larval state and to eat the young.

Cetotolithes (Gk *κίτος* whale, *λίθος*, ear, *λίθος*, stone), parts of the ear-bone of a whale found fossil in great abundance in the Upper Tertiary on account of their hardness. They have been used in the manu. of superphosphate of potash for artificial manure.

Cetraria Islandica, or Iceland Moss, fruticose or shrub-like lichen procured mostly from Norway and Iceland, but also a native of the higher mts of N. Britain. When dry, it is almost odourless and the taste is bitter and unpleasant, but when the bitter principle is removed it becomes a wholesome and palatable food. It must first be boiled in water, upon which it becomes a mucilaginous fluid; unless steeped it is offensively bitter, and its purgative properties have given it the name of *Lichen catharticus*.

Cette (anc. *Seton*), seaport in Hérault, France, and situated 17 m. S.W. of Montpellier at the entrance to the Than lagoon, and a few miles E. of the meeting of the Canal du Midi with the Mediter-

anean. It has an excellent harbour, and its sea-bathing and mineral springs form a great attraction to visitors. There is an extensive fishing industry and the prin. trade is done in liqueurs, beer, wines, and brandy, all made in the tn. The tn. is of Gk. foundation. Pop. 36,000.

Cettinje (**Cetynje**), formerly the cap. of Montenegro; but, nestling as it does on a bare plateau 6000 yds. long by 1000 wide beneath the Black Mt., it was much too close to the guns of Cattaro for safety when Austrian military power began to draw southward in the First World War. Its sole building of any size is the New Palace, which was built by King Nicholas. The old palace, the Bilharda, in appearance like a fortress, was a military school during the First World War. The walls of the tn. were dismantled just before the war. For the rest C. is a tn. of cottages and a few residences of foreigners. Repeatedly, since its foundation in 1484 C. has fallen to the Turks, but at last, in 1715, with the aid of Russian mercenaries, the Montenegrins succeeded in driving out the Turks for ever. After the battle of Mt. Lovchen in 1916 its fall was certain. After that event, the Montenegrin authorities proposed to transfer the seat of gov. to Nikshich, but the whole country was ultimately absorbed in Yugoslavia. Pop. 6000. In 1918 it was announced that the war-damaged town of Podgorica was being rebuilt as the future cap. of Montenegro, under the name of Titograd.

Cetus, The Sea Monster, is a constellation situated below Pisces and Aries, and was supposed to represent the sea monster about to devour Andromeda. Although it covers a large expanse of sky, no star in it is of a brighter magnitude than the third. *Mira Ceti* is a long-period variable. In about 332 days it increases in brightness from below the ninth magnitude (when it is only visible with a telescope) to about the second magnitude, and then declines. Its period varies from 320 to 370 days, and its maximum and minimum luminosity is not invariable. It is historically interesting as being the first recorded variable, its fluctuations being noticed in the first instance by David Fabricius in 1596. C. contains many of the so-called 'white' nebulae, one of the most important being discovered by Caroline Herschel in 1781. It was at first thought to be elliptical in form, but its true shape has now been shown by Dr. Roberts to be spiral.

Cetyl Alcohol, see ETHAL.

Cetywayo, phonetically spelt **Ketsiwayo** (c. 1836-84), son of the Zulu king Panda, whom he deposed in 1856. He defeated his brother Umbulazi and then his right to the throne was acknowledged by Natal on the conditions that he dispersed his troops and gave up his barbarous mode of governing. It was owing to the Transvaal being annexed in 1877 that England had to enforce these measures, and in 1879 C. was made a prisoner by Maj. Maiter and lodged in Cape Town.

He was brought to England in 1882, but through pressure of public opinion he was restored as king of the Zulus again in 1883. However, very soon after he returned to his native land he was attacked and beaten up by one of his old enemies named Ushobu, and had to seek an asylum in the native reserve on Brit. ter. *D.* at Eshowe Feb. 8.

Ceulen, or Keulen, Van, see VAN CUTEEN.

Ceuta, fort and seaport belonging to Spain and situated on the E. of the Moroccan peninsula, which juts out N. towards Gibraltar. It is supposed to be the auct. tn. Abyla, one of the mythical Pillars of Hercules. It consists of an old tn. right on the tongue of the peninsula, and a new tn. running up the hills at the back. It is a bishop's see, and has a fine fifteenth-century cathedral. C. was a very busy tn. once and did a great trade under both Rom. and Arab rule. It was conquered by King John I. of Portugal in 1415, but passed into the hands of Spain in 1580. Pop. 40,000.

Ceutorhynchus, genus of coleopterous insects of the family Curculionidae, is a small weevil with many species, which frequent various plants.

Cevadilla, Sebadilla, and Sabadilla, are various Sp.-Mexican names applied to filicaceous plants containing veratrine. *Schanoacaulon officinale* is one of these plants and the alkaloid is derived from its dried fruits. *Helonias officinale* is another species, a native of N. America; *Veratrum album*, often known as white hellebore root, and *V. sabadilla* are gathered for the veratrine-yielding rhizomes. These hellebore alkaloids, of unknown constitution, but of considerable physiological activity, have not found much use in medicine. The alkaloid *jerrine* forms crystalline salts. *Protoveratrine* is very poisonous and causes violent sneezing. The other alkaloids, *protoveratridine* and *veratrodine* are of little importance. See also VERATRINE, VERATRUM.

Cevadine, alkaloidal substance found in hellebore and sabadilla. It occurs in white crystals, soluble in water, alcohol, and ether. In medicine it has been used to expel worms, but it is very poisonous.

Cévennes (from Celtic root, cf. Welsh *cefn*, ridge), important mt. range in S.E. France, extending (in its widest application) from Canal du Midi (N. of Carcassonne) to the S. of the Côte d'Or. This range is some 330 m. long, forms the S.E. border of the central plateau and the watershed between the Rhône and Garonne. Sometimes the name is confined to the S. ranges only, ending at the gorge of the Chassezac. N. of Montagne de Lozère. In its narrowest significance it means only those mts. E. of the plateaux of the Causses, beginning with Lozère plateau and ending with those round Aigoual at the head of the Gard valley. The large group is divided into two divs.: N. with Monts du Charolais, Beaujolais, Lyonnais, Vivarais (Mt. Mézenc), and S. with Montagnes Noires, Cévennes proper, Garrigues, Monts

de l'Épinouse and Lozère (Lozère, Pic de Pinels, Mt. Aigoual). The Loire, Allier, Tarn, Aveyron, Gard, and other rivers, rise in the C. In the N.E. a railway from Nîmes crosses the range by Alais to the valley of Allier and Clermont. The central mass lies in the depts. of Ardèche, Lozère, Haute-Loire. The rocks are chiefly metamorphic and granitic, volcanic in parts. The C. have been the scene of much religious warfare. The revolt of the Camisards occurred here, where many Protestant families found refuge after the revocation of the Edict of Nantes (1685). Also an old dist. of France, cap. Mende. See R. L. Stevenson, *Travels with a Donkey in the Cévennes*, 1879; Porcher, *Le Pays de Camisards*, 1894; Ribard, *L'Histoire cévenole d'après des documents*, 1898.

Ceylon (Sanskrit *Sinhala*), is, in the Indian Ocean, until 1948 crown colony of Great Britain, when it became a self-governing dominion. It is separated from India by the Gulf of Manaar and Palk Strait, but virtually joined to the mainland by the submerged coral reefs and sandbanks known as Adam's Bridge, and by Rameswaram Is. It lies between 5° 55' and 9° 50' N. lat., and 79° 40' and 80° 53' E. long. Length from Dondra Head to Palmyra Point about 256 m., width varies from 32 to 140 m. Area over 25,000 sq. m. The Is. is mountainous in the S., expanding into a wide plain towards the N., still partly impenetrable jungle. The loftiest peak is Pidurutalagala (Pedurutalagalla), over 8000 ft., the best known is Adam's Peak, over 7000 ft. There are nine provs. for administrative purposes presided over by gov. agents. The longest riv. is Mahavelli Ganga, flowing into the sea by Trincomalee Bay. There are no lakes. The S.W. is damp, but N.E. and S.E. require irrigation, and remains of vast reservoir basins for this purpose are found in the N.

The climate is tropical, but the heat is tempered by the surrounding sea; unhealthy in the coast dists., it is not so in the interior hilly parts. Newera Eliya, where there is a sanatorium, has a mean temp. of 58°. Colombo one of 80°. Among C.'s chief tns. are Colombo (its cap. and chief seaport), Jaffna, Kandy, Kalutara, Peradeniya and Point de Galle. In the N. are the ruins of Anuradhapura. There are sev. short railway lines, the longest being between Colombo and Kandy. The total railway mileage is a little over 910 (807 being 5 ft. 6 in. gauge, the rest 2 ft. 6 in.). The soil is mostly fertile, and vegetation very luxuriant. The time of greatest heat is between the two monsoons, from Feb. to May. Forests abound, and also plantations of coco, areca, tea, and coffee. Since the blight of 1870 (*Hemileia vastatrix*) the cultivation of coffee has been replaced by that of tea. Other products are rice, coco-nut, cinnamon, cardamoms, and tobacco. The stiff fibres of the palmyra palm are prepared as a substitute for bristles, and the palmyra is also used for food. C. provides Europe with its largest supply of cinchona, and is third among the

tea-producing countries of the world. Rice is the prin. form of indigenous agriculture, and more profitably grown in the wet regions than in the dry, though in the jungle and forest tracts a sparse pop. lives on patches of rice and dry grain.

Of its mineral resources plumbago (graphite) and talc are of most commercial value; others are gold, iron, and precious stones, notably rubies and sapphires. In Oct. 1942 it was announced that the presence of vanadium had been discovered in large quantities in the is. Among native animals are tuskless elephants,

the is. was ceded to Britain under the treaty of Amiens (Mar. 25, 1802), and C. was then formed into a separate crown colony, the Kandyan kings finally disappearing voluntarily, 1815. The is. of C. was known to the Gks. and Roms. under the name of Taprobane (copper leaf) and in later times Serendib, Sirinduil, and Zeylan were used to designate it by writers of the W. and E. worlds. The pop. is approximately 5,314,000, the dominant race being the Sinhalese, 3,500,000. These are descendants of colonists from the Ganges valley who



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TEA PLANTATION DISTRICT IN CEYLON: ON THE LEFT, ADAM'S PEAK

bears, panthers, various kinds of deer, and monkeys, leopards, and buffaloes. There are countless kinds of ferns and flowers, innumerable species of birds, and many reptiles, including crocodiles. C. has been called the 'pearl garden' of the earth, and the pearl-oyster fisheries on the coast have sometimes yielded a fair profit. For further details see Herdman, *Report on the Pearl-Oyster Fisheries* (1903-4). C.'s chief imports are rice, cotton manufs., sugar, coal, manures, and spirits. The leading exports in order of total value are tea, rubber, copra, coco-nut oil, cinnamon, cacao, citronella oil, cardamoms, coir and areca nuts, plumbago, and unmanufactured tobacco. The value of the imports into the United Kingdom (in 1939) was £10,743,000, and of the exports of Brit. goods to C. about £2,000,000 (1942 and 1943). The Portuguese reached C. 1505, and estab. commercial settlements. They were driven away by the Dutch, 1656. In 1785 C. passed into Eng. possession, being first annexed to Madras; six years later

settled in C. in the sixth century B.C. and estab. the Sinhalese dynasty. Sinhalese kings ruled from 543 B.C. to A.D. 1815.

Sinhalese, the most widely spoken language, is an Indo-Aryan language, derived immediately from Sanscrit. Many words spring from Pali, which is studied by the learned as the sacred language of Buddhism and is largely used for literary purposes. Tamil, a Dravidian dialect, is spoken in the N. The Sinhalese are Buddhists, the introduction of Buddhism into C. dating from the third century B.C., when Mahinda came from India and estab. it under King Tissa (a contemporary of Asoka). As a result of many generations of war the N. regions were occupied by Tamils, a Dravidic people from S. India, and the pop. of these dists. is almost wholly Tamil, numbering to-day 1,100,000, and mainly Hindu in religion. The remainder of the pop. are mostly Muslims or Moormen, thought to be of Arabic descent, and numbering about 300,000; they are the most energetic and intelligent. There are also about

35,000 burghers—descendants of Dutch settlers—and Eurasians, 15,000 Malays, and 12,000 Europeans. There are fewer than 500,000 Christians, and the Muslims number about 300,000. Apart from differences of race and religion, caste is a recognised feature of the Sinhalese and Tamil social systems. Inter-marriage between the racial groups or between the higher and lower castes in the groups are comparatively few. The pop. is densest in the wet regions of the S.W. and N., with an ann. rainfall of 200–250 in. and producing most of the exportable wealth. The rainfall of the dryer N.W. and S.E. being only 20–25 in., production there is far less profitable; while in the jungle tracts production is so meagre that poverty and disease are almost unmanageable problems. Europeans own most of the tea plantations. Much of the work is done by Indian Tamils, the great majority of whom are immigrant labourers from S. India who belong to the humblest castes and have a standard of living and culture inferior to that of the peasantry in C. These Indian Tamils are a separate racial group, and number 600,000, and as they usually return to India after a few years, they present a problem in the development of representative gov., but there has been a strong movement to reduce their number in order to give work to the Sinhalese. Though the Sinhalese predominate, they are not absorbing the other races. They are mainly engaged on the soil. The burghers find their occupations chiefly as gov. servants and in the tns. The more important industries are gold, silver, brass, ivory, and tortoiseshell articles, pottery, weaving, and metal and lacquer work, basket- and mat-making. There are cigarette, match, and soap factories. Factories have also been recently estab. for acetic acid, ceramics, coil, glass, quinine, plywood, paper, leather, hats, and steel plates; caffeine and shark-liver oil plants—mostly estab. by the dept. of commerce and industries. The manu. of salt is a gov. monopoly. The Europeans are mainly employed as gov. servants in all parts, on the tea and rubber estates, and in European business in the large tns. The tn. pop. is growing, and in Colombo particularly, with its cosmopolitan pop. of 285,000, problems typical of tn. life have already emerged. Eighty-five per cent of the people live outside the tns. Over half the pop. can neither read nor write. This fact was prejudicial to the great extension of the franchise which was proposed under the Donoughmore constitution. In 1913 there were over 2100 gov. (Sinhalese and Tamil) schools, with about 142,000 boys and 98,000 girls, and 1820 aided schools (125,000 boys and 200,000 girls), where education is free. Fees are charged in the 400 Eng. and bilingual schools (54,000 boys, 20,000 girls). There is a Royal College, a gov. training college, and a technical college in Colombo. On July 21, 1942, the Univ. College of Colombo, founded in 1921, was inaugurated as the univ. of C.

Constitutional Developments.—A reformed Legislative Council came into existence in 1912. But the only new features were the introduction of the elective principle and the representation of the Sinhalese and Tamil middle class. The official majority was maintained by the addition of two official members. On the whole the reforms inaugurated by Sir Henry McCallum helped to perpetuate the divs. In society, the special interests of which the Brit. system of administration for over a century had tended to obliterate. The constitutional reforms initiated by Sir Wm. Manning (governor from 1918 to 1925) and Sir Graeme Thomson (1931–33) were the most important political events of the period subsequent to the rule of McCallum. After McCallum's time the middle class grew in strength with the extension of plantations and trade, the expansion of gov. services, and the growth of the professions, and by 1917 it began to ask once more for a reform of the constitution. The agitation for reform received an impetus from various new factors. In 1915, during the First World War, riots occurred in the is., which were, probably erroneously, supposed to be a manifestation of hostility to Brit. rule. The agitation for reform began in 1917 with the formation of the C. Reform League and of the C. National Congress in 1919. Broadly speaking, the agitators demanded a constitution similar to that recommended by Lord Willingdon for the presidency of Bombay. They wanted parli. institutions for C.; full representative gov. and an executive partially responsible to the legislature. In response to these demands the secretary of state for the colonies in consultation with Governor Sir Wm. Manning issued an Order in Council in Aug. 1920 which introduced a constitution somewhat resembling that which was granted to the Indian provs. by the Morley-Minto reforms in 1909. (See INDIA, *History*.) These reforms introduced the principle of representative gov., but in reality gave no power to the Sinhalese. The Order in Council gave further extraordinary powers to the governor: he had the right to stop the discussion of any Bill or resolution, to limit the time of any discussion, and to suspend unofficial members. There was further agitation by the C. National Congress, followed by new recommendations by Manning, but the secretary of state refused to make any fundamental change. He agreed with Manning that for an indefinite period representation must be communal, on the ground that it would take many years for the mass of the electorate to develop a political instinct strong enough to rise above racial and religious divs. The importance of C. in view of its strategic position in relation to India and Brit. communications with the E. was fully realised at this time as a result of the First World War, and this, conceivably, deterred the consideration of any proposals to start C. on the road to self-gov. Sir Hugh Clifford (1925–27), who succeeded Manning, reported to the

secretary of state that the new constitution did not work satisfactorily, and a commission under the chairmanship of the late earl of Donoughmore was appointed to visit C. to report on the working of the existing constitution and to consider proposals for its revision. Their famous report was submitted in June 1928, or about seven months after they had first arrived in C.

The most remarkable feature of the pre-Donoughmore constitution was the divorce of power from responsibility, the governor's power but not his responsibility having been transferred in part to the unofficial members of the legislative council. He could only make laws or levy taxes with the advice and consent of the legislature, and yet he was the complete autocrat so long as all his legislators were officials on whose votes he could rely. It was this anomaly that focused the attention of the Donoughmore commission. C. had reached that stage in the development of crown colony gov. when the official majority in the council had become converted into a permanent minority, this being largely due to the introduction, in 1921, of territorial representation by election. It was generally agreed that this constitution had only produced a political atmosphere of barren controversy, entirely unfavourable to the solution of the is.'s political and economic problems, especially at a time when much depression prevailed through the world demand for its products being much below the supply. A kind of administrative impasse had been reached, for the gov., in effect a European gov., was at once independent for its existence, but yet largely dependent for its effectiveness, upon a predominantly 'Ceylonese' council ('Ceylonese' meaning in this context those who have made the is. their permanent home). This anti-thesis provoked a perpetual challenge to Brit. predominance in the affairs of the colony. Moreover, another cause for discontent among the native elements was the fact that (in 1928) something like 62 per cent of the total exportable wealth of the is. belonged to the Europeans, while no less than £100,000,000 worth of European capital, chiefly Brit., was invested in the agriculture and trade of the colony. The theory of the old constitution that the gov. should be a partnership had therefore broken down, or, at all events, had become a mockery of the party system, because the gov. could not claim to represent any one racial group in the council, whereas the unofficial block, externally united only in attacking the gov., were divided upon every other positive matter. The Donoughmore commission made political re-education the main requirement of the situation, and proposed universal suffrage subject to those of the Tamils who were otherwise qualified making a declaration of permanent settlement in C. The commission suggested a novel expedient for the solution of C.'s constitutional problem. They did not consider a parl. form of gov. suitable for C., as there was

no party system and divs. were possible only on communal lines. They proposed therefore the estab. for the gov. of C. of a system which had hitherto worked satisfactorily in the sphere of local gov. They recommended the estab. of a State Council which would give both responsibility and power to its members. It was to possess legislative powers as a general body. It was also to exercise its powers. The depts. of gov. were to be divided into ten groups. Three of them were to be in charge of officers of state, the chief secretary, the financial secretary, and the attorney-general (late



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THE OLD DUTCH GATE AT GALLE

legal secretary), who were to be members of the State Council but without the right to vote. The remaining seven groups were to be controlled by the elected members of the State Council, who were to be divided into seven executive committees of home affairs, agriculture and lands, local administration, health, labour, industry, and commerce, education, and communications and works. These committees were to elect their chairmen, and these chairmen, together with the officers of state, were to form the board of ministers. The State Council was to consist of sixty-five territorially elected members, in addition to the twelve nominated members. Officials, of course, had no place in such a council, where there was no question of commanding a majority. Sir Herbert Stanley (1927-31), who succeeded Clifford, considered that some of the conclusions of the commissioners were too sweeping in their condemnation of the Manning constitution of 1924, but he supported their main proposals and defended them

against the objections raised by the Legislative Council. The Legislative Council, whose representation was based on communal lines, naturally opposed the abolition of communal representation. The Sinhalese supported the commissioners as its abolition coincided with their interests. The Tamils objected to the estab. of electorates based on numbers which would prejudice their influence; the Muslims and burghers, however, supported communal representation as it was their one safeguard against political extinction. Stanley sympathised with the fears of the Tamils, the Muslims, and the burghers, but agreed with the commission that any advance towards self-gov. should be accompanied by the abolition of communal representation. The other features in the Donoughmore report which were strongly opposed were the system of executive committees and the wide powers given to the governor. The executive committee system was condemned 'either as unworkable or as derogatory to the status and proper functions of a minister . . . or as an impediment to further constitutional evolution towards the desired goal.' Stanley considered the executive committee system fundamental to the whole scheme of gov. proposed in the report, and he objected also to any reduction of the powers recommended to be given to the governor in view of the important changes proposed and the wide powers that were to be given to the State Council. The secretary of state agreed on the whole with Stanley, but contrary to Stanley's views he agreed to the proposal of the Legislative Council to have a State Council of fifty territorially elected members and eight nominated members, of whom four were to be Europeans. The proposals of the secretary of state were finally accepted in the council by the unofficial members by nineteen votes to seventeen. The Donoughmore constitution was estab. by Sir Graeme Thomson in 1931. A board of ministers consisting of seven Ceylonese ministers, three of whom belonged to the minority communities, replaced the executive council which came into existence with the estab. of the crown colony system of gov. in 1802. Sir Baron Jayatilaka, who had played an important part in the movement for reform, became the leader of the House and the vice-chairman of the board of ministers. The Donoughmore constitution did not satisfy all sections of opinion and requests for changes were made from 1932, but the secretary of state refused to consider any radical alteration of the constitution before it was given a fair trial. The Donoughmore constitution, however, was always regarded as a preliminary step to responsible gov., and in 1937 Sir Andrew Caldecott was asked by the secretary of state to examine the position and submit recommendations. He objected to the proposals to restrict the franchise (to those who had an abiding interest in C. or who might be regarded as permanently settled in the is.) or to curtail

the powers of the gov. He agreed with the objections that had been raised against the executive committee system, and suggested its abolition as 'there was no determining, co-ordinating, controlling, or designing force behind the administrative machine and everything depended upon bargaining and compromise.' He was for the estab. of a cabinet system of gov. by the exclusion of the officers of state and the appointment of two other ministers to be entrusted with their work. These proposals led to no general agreement and the Colonial Office felt that the whole position should, in view of the approach of war, be postponed for fuller consideration. The war had the effect of making the Brit. once more emphasise their ideals of freedom and democracy and offer dominion status to India. In 1942 the State Council of C. asked for dominion status for C., and in the result they largely attained their ambition.

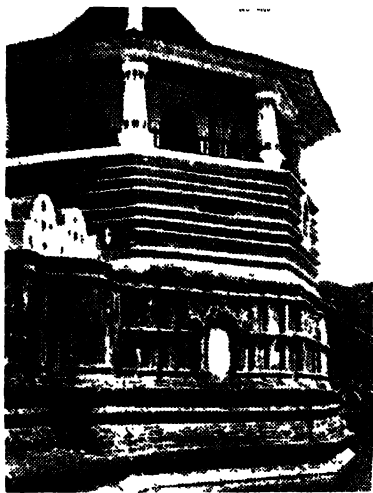
After the war a new commission under the chairmanship of Lord Soulbury visited C. and in their report they recommended a form of constitution largely akin to the Brit. constitution. The commissioners thought that the then existing system of universal suffrage should be retained and they recommended the setting up of a Senate of thirty members and a House of Representatives of ninety-five elected members plus six members nominated by the governor-general. Instead of the 'board of ministers' there would be a Cabinet responsible to the legislature. The governor-general would be empowered to legislate on external affairs and defence. Currency Bills and any Bill likely to involve 'oppression or serious injustice' to any racial or religious community would be treated as 'reserved' Bills. The Soulbury commission did not believe that there was any serious body of opinion in the is. that questioned the need for its dependence upon the United Kingdom for some time to come in matters of defence and external affairs; hence the commission did not recommend dominion status immediately — apart from the effect immediate dominion status might have on the minorities. The Brit. Gov. (Oct. 1945) accepted the Soulbury committee's report, having come to the conclusion that a constitution on the general lines proposed by the commission conformed in broad outline, save as regarded the second chamber, with the constitutional scheme put forward by the C. ministers themselves (see Cmd. 6690, 1945, Statement of Policy on Constitutional Reform). When the Soulbury report was under discussion considerable apprehension was expressed about the effect of its proposals upon the position of the minority communities in general and the Tamils in particular. The Tamils had long pressed for such a weight in the legislature as would enable them to deal on terms of something like equality with the Sinhalese majority, from whom they are distinguished by religion and customs as well as by race. But their contentions were not

accepted either by the commission or by the gov. When the new constitution was debated in the State Council the eagerness for self-gov., which their representatives shared with the majority community, resulted in the overwhelming majority for acceptance that led up to the new Order in Council embodying the constitution (pub. May 15, 1916). In the new constitution the State Council is replaced by a Parliament consisting of His Majesty, represented by the governor, and two Chambers to be known respectively as the Senate and the House of Representatives. The C. Parliament will

power to legislate by Order in Council for defence and external affairs and to amend or revoke the constitution. As regards prov. gov., the offices of the gov. agents are the prov. treasuries. The gov. agents are, generally, assisted by assistant gov. agents, who are in charge of revenue dists. The officer immediately subordinate to the gov. agent is the chief headman, who is variously styled Mudaliyar in the maritime Sinhalese dists., Ratemahatmaya in the Kandyan dists., Maniagar, Adigar, and Vanniya in the Tamil dists.

Ceylon in the Second World War.—There were Jap. air attacks on Colombo, April 5, 1942. Some seventy-five Jap. planes, operating from carriers, made dive-bombing attacks on the harbour and in the Rotnamada area. Twenty-seven Jap. planes were destroyed and at least twenty-five more seriously damaged. Brit. losses were slight, and casualties were about fifty. A large Jap. bomber force with fighter escort attacked the Trincomalee naval base, April 9, 1942, causing damage to the harbour and aerodrome and some casualties among dockyard workers and naval personnel. At least twenty-one enemy planes were destroyed and a few Brit. planes were lost.

Ceylon attains Dominion Status.—C. became a self-governing dominion of the Brit. Commonwealth on Feb. 4, 1948, with the putting into force of the Independence Act, which was passed by the Brit. Parliament in Dec. 1947. The first session of the new Parliament of C. was opened on Feb. 10, 1948, by the duke of Gloucester under special commission from the king. The Order in Council giving effect to the Independence Act replaced the governor by a governor-general appointed on the advice of the Prime Minister of C. and representing the king. The Gov. of the United Kingdom is now represented by a high commissioner as in the case of the other dominions. Agreements, concluded in Nov. 1947 between the United Kingdom Gov. and the Gov. of C. as a prelude to this constitutional development, making provision for defence and external affairs, became operative with the inauguration of the Soulbury constitution in 1948. Under these agreements Britain and C. will give each other such military assistance for the security of their ters., for defence against external aggression, and for the protection of essential communications as it may be in their mutual interest to provide. The United Kingdom Gov. may base such naval and air forces and maintain such land forces in C. as may be required for these purposes as may be mutually agreed. The United Kingdom Gov. will also furnish the Gov. of C. with such military assistance as may from time to time be required towards the training and development of Ceylonese armed forces. The agreement relative to external affairs declares the readiness of C. to adopt and follow the resolutions of past Imperial conferences (q.v.); makes arrangements for the interchange of information, consultation, and diplomatic representation; and pledges United King-



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THE TEMPLE OF THE TOOTH, KANDY

have full power to make laws for the peace, order, and good gov. of the is., but it may not make laws which discriminate against any community or religion, or interfere with freedom of worship, or with the constitutions of religious bodies without their concurrence. There is a Cabinet of ministers (one of whom will be Prime Minister) who are charged with the general direction and control of the gov. of the is. and will be collectively responsible to the C. Parliament. The governor is required to reserve for His Majesty's assent a few classes of Bills only. These include Bills relating to defence and external affairs and Bills which, in the governor's opinion, have evoked serious opposition by any religious or racial community and are likely to involve oppression or serious injustice to any such community. Bills relating solely to certain specified subjects, such as franchise and immigration, are excluded from the classes of Bills to be reserved. His Majesty's Gov. retain the

dom support for any application by C. for membership of the United Nations or any specialised international agency. Brit. tutelage of C. lasted a century and a half. The devolution of power and responsibility by the Brit. Gov. to the elected representatives of C. was effected so smoothly and sympathetically that the newly won freedom of the Ceylonese people served rather to underline the achievements of the Brit. period in economic prosperity, in educational development, in the estab. of law and order, in the growth of a sound judicial system, in public health, and, not least, in a respect for those values which make democratic gov. possible in a community comprising sev. minorities of different race and religion.

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Cézanne, Paul (1839-1906), celebrated Fr. painter and founder of the Post-Impressionist school, b. at Aix, Provence, Jan. 10, son of a banker. At first destined for a banking career, but early forsook his father's business house to study at the art school in Paris. Was influenced to some extent by the adherents of Manet, but was

more revolutionary than others of that group. He seems to have taken part in the Commune, while in Paris, but there-after returned to Aix, where he spent the remainder of an uneventful life painting landscape studies and portrait studies. He was a contemporary of the Impressionists, and used their colour palette with the addition of brown, a colour peculiar to the sun-scorched S. of France. When C. left Paris and returned to Aix, he set himself the task, as he said, 'to make of Impressionism something solid and enduring like the art of the Old Masters.' His early rather flashy style of painting gave way to a method of absolute sincerity. No brush-stroke was



Druck

CÉZANNE'S 'WOMAN WITH ROSARY'

placed upon the canvas that was not realised, and it is this honesty of purpose rather than a facility in drawing that has made C. an acknowledged world master. His 'Dahlias' and his 'House of the Hanged Man' estab. him as a great painter of still life, as also the 'Card Players,' which is notable for apparent defects of drawing which have been imitated by followers who did not understand the principles of his workmanship; for with faults or apparent faults in drawing went also subtlety and skill in developing form through colour. Contrasted with Manet and Monet, C. did not see things in masses of smooth colour or bathed in colour-light, but rather 'as giving back colours which had their own given qualities and values, due to their own grave vibrations, just as notes in music have their own sound vibrations'; and indeed he spent a long life in trying to grasp and fix the laws of the vibrations of colour, and in this work he strongly influenced the later generation, particularly Van Gogh and Gauguin. See E. Bernard, *Souvenirs sur Paul Cézanne*,

1924; A. Volland, *Paul Cézanne, his Life and Art* (Eng. translation), 1924; E. Faure, *Paul Cézanne*, 1926; Roger Fry, *Cézanne*, 1927; J. Meier-Graef, *Cézanne*, 1927; J. Gasquet, *Cézanne: what he said to me*, 1931; G. Mack, *Paul Cézanne*, 1935.

Cezimbra, tn. on the coast of Portugal, 20 m. S. of Lisbon. Fishing extensive. Pop. 12,000.

Chabas, François Joseph (1817-82), Fr. Egyptologist, b. near Briançon. In 1873 he was offered the chair of Egyptian language and archaeology in the Collège de France, but he refused it. He wrote *Histoire de la XIX^e Dynastie* (1873), and *Études sur l'antiquité historique d'après les sources égyptiennes* (1874). He was also the editor of *L'Égyptologie*, an archaeological paper, between the years 1873 and 1877. Maspero wrote his biography, which was attached to an ed. of his *Œuvres diverses*, in 1899.

Chabert, Philippe (1737-1814), Fr. veterinary surgeon, b. at Lyons; studied in the veterinary school there, and in 1766 obtained an important post at Alfort, finally becoming director of the school there. In 1780 he succeeded Bourgelat as director and inspector of veterinary schools throughout the country. He was a member of the Institute of France and numerous other learned societies, and wrote sev. valuable works on veterinary practice.

Chabeuil, Fr. tn. in the dept. of Drôme. It stands on the Véore, S.E. of Valence. It is supposed to be the anc. city of Cerebellaca. Pop. 2000.

Chablais, former prov. of Savoy (old div. of Annecy), bordering on Lake Geneva. Now included in the Fr. dept. of Haute-Savoie, arrond. of Thonon. In the Middle Ages it had counts and dukes as rulers.

Chablis, Fr. tn., dept. of Yonne, about 9 m. from Auxerre, on R. Seine. Noted for famous white wine (Chablis) produced near by. Pop. 1900.

Chabot, Charles (1815-82), Eng. lithographer and calligraphic expert. He was b. at Hattersea and d. at Clapham. His skill as a calligraphist was much in demand at the law courts; he gave evidence in the celebrated Roupell and Tichborne cases. He identified Sir Philip Francis as being the author of the *Letters of Junius*.

Chabot, François (1759-94), Fr. revolutionist. Originally a Capuchin monk, but became an atheist of corrupt and vicious character. In 1790 he became a member of the Constituent Assembly, and gained great power as an extreme and fanatical democrat, instigating many of the worst excesses committed by the party, and being noted for his daring, blasphemy, and disgusting immorality. He was finally guillotined by order of Robespierre.

Chabot, Philippe de (1480-1543), Fr. soldier and count of Charny and Buzançois. Known as *L'Amiral de Brion*. In 1524 he saved Marsellos from the Imperialists, and in 1525 was made a prisoner at Pavia. He was made governor of Burgundy and admiral of France in

1526, after which he conquered the greater part of Piedmont. He later on fell into disgrace and was imprisoned for two years.

Chabrias, famous Athenian general, commander of an army as early as 392 B.C. In 390 he took part in the Thracian expedition of Thrasybulus. In 388, on his way to Cyprus to help Evagoras against the Persians, he defeated the Spartans at Ægina. In 378 C. commanded against the Spartans and drove Agesilaus from Boeotia, inventing the famous manoeuvre of receiving a charge on the left knee, with shields resting on the ground and spears levelled at the foe. In 376 he won the naval victory at Naxos; 373 went with Iphicrates to Coreyra; 369 fought against Thebans in Peloponnesus, repulsing Epaminondas before Corinth; 367-366 was accused of treason over the Theban capture of Oropus, but was acquitted. In the Social war (357) he joined Chares in command of the Athenian fleet, and was killed as trierarch at the siege of Chios. See Cornelius Nepos, *Chabrias*; Xenophon, *Hellenica*, v.; Rohdant, *Die Iphicrates, Chabrias et Timotheus*, 1845.

Chabrier, Alexis Emmanuel (1842-94), Fr. musical composer. He was b. at Ambert in the dept. of Puy-de-Dôme. In 1877 he wrote *L'Étoile* (an operetta) and in 1883 *Des Pâques pittoresques* for the piano. He was chorus-master at the Château d'Eau theatre in 1884-85, where he played at concerts. While there he assisted Lamoureux (q.v.) to produce two acts of *Tristan and Isolde*. He also brought out *La Salamite* in 1885, and also selections from his opera *Gwendoline*, which was done as a whole in Brussels in 1886. His orchestral rhapsody, *España*, was a triumph, but the Paris Opera, while accepting his opera *Le Roi Malade* (unrejected his *Gwendoline* as 'Wagnerian'). For his harmonic and orchestral experiments he may be regarded as a forerunner of Debussy and Ravel. When he d. he left his opera *Brusis* unfinished.

Chabron, Marie Etienne Emmanuel Bertrand de (1806-89), Fr. general and politician, b. at Retournac (Haute-Loire). He served with distinction in the Crimean war, the It. war, in which he fought at the battle of Palestro, and the Franco-Ger. war of 1870-71, being made a general of div. by Gambetta for the relief of Belfort. At the close of the war he was elected deputy for Haute-Loire, and later became a senator.

Chacatos, see CHOCOTAWS.

Chachapoyas, or San Juan de la Frontera, tn. in Peru, cap. of Amazonas, situated 80 m. N.E. of Cayamarca. Pop. 4000.

Chacma, or *Cynocephalus* (or *Papio*) *porcarius*, largest species of baboon (q.v.), belonging to the family Cercopithecidae (q.v.), and nearly allied to the mandrill. It is a native of S. Africa, and in habit it is gregarious. Although largely vegetarian in diet, it is omnivorous at times and is fond of insects.

Chaco, ter. In the Argentine Republic, which is part of the Gran Chaco, S. of the

Hernero R. Timber-felling is the chief industry, but cattle-grazing and agriculture are also carried on. The cap. is Resistencia, which is also the governing centre, and is 400 m. N. of Buenos Aires. The area covers 52,471 sq. m. Pop. 58,000.

Chaco War, fought from July 1932 to Jan. 1936, between Bolivia and Paraguay. The dispute over the boundaries of the Gran Chaco was of over fifty years' standing. The first military incidents in the war occurred early in 1927, and by the middle of 1933 hostilities had developed into extensive trench warfare, with aeroplanes and armoured cars. In 1933 the League of Nations Council, on the suggestion of the belligerents, invited Argentina, Chile, and Peru to intervene, it being their opinion that this offered a better chance of solution than mediation by a League commission. But the S. Amer. countries refused the invitation, and hostilities dragged on until Oct. 1935, when a peace treaty was negotiated by which Paraguay granted to Bolivia a free zone at Puerto Casado, on the Paraguay R., other points being settled in the ensuing year.

Chaconne (Fr.), dance, probably of Sp. origin. It was once extremely popular, but now it is utterly forgotten and neglected, possibly because the movements thereof were slow and stately. The music was generally a number of variations on a ground bass of eight bars. Bach, Handel, and Porpora all wrote C music, of which the C. of Bach (the last movement of the D minor Suite or '2nd Partita') for solo violin is the most famous.

Chad, name given to the young of a fish—the common sea bream—by the fishermen of Devon and Cornwall.

Chad, St. or Ceadda (d. 672), was b. in Northumbria and was a follower of St. Aidan. He became bishop of the E. Saxons in the year 664, bishop of York in 666, and then bishop of Mercia in 669. He was a holy and very austere man.

Chad, Tohad, or Tsad, Lake, or rather two large but shallow lakes, surrounded by swamps, in W. Africa, situated between Bornu, Bagirmi, Kanem, and Wadai. The total length from N. to S. is from 120 to 150 m., while from E. to W. it is estimated at from 60 to 130 m. The lake is studded with is., and the depth is from 8 to 15 ft. The area varies according to the season; if it is wet it covers about 20,000 sq. m., and if dry 10,000. Lake Chad gets most of its water from the Shari, but it also gets the waters of the Waube or Yo (otherwise the Komadugu Yohe). There are many fish to be found there, and it is also frequented by wild fowl, hippopotami, and alligators. The convention of 1898 gave France the right to the E. shore. There are two groups of is., the Kuri archipelago in the S. and the Buduma in the N. They are inhabited by the Buduma and Kuri tribes.

Chad Colony, in the Fr. Congo. A ter. with an area of 461,200 sq. n. and a pop. of 1,433,000 natives and about 600 Europeans. It was formerly a dependency of the Ubangi-Shari colony, but by decree

on March 17, 1920, it was made a separate colony. It extends from Lake Chad across the E. Sudan and includes Wadai to the E. of Kanem, which has an area of 170,000 sq. m. and which accepted the Fr. protectorate in 1903. Great numbers of cattle, sheep, camels, horses, and asses are raised in the colony. Kanem state to the N.E. of Lake Chad, which came under Fr. control in 1903, is also now a part of the colony of Chad with Mada as its cap. Copper, zinc, and lead are among the minerals found. The Fr. owe the conquest of this region to the activities of Savorgnan de Brazza, who in 1885 led an expedition through Ubangi to Sangha; to Lieut. Gentil, who founded Fort Archambault; to Commandant Lamy, from whom is named the cap., Fort Lamy; and above all to Lieut. Binger, from whom is named Bingerville. It is noteworthy that the colony of Chad was the first Fr. overseas ter. openly to support de Gaulle (q.v.) and the Fighting Fr. against the Fascist powers in the Second World War.

Chadderton, par. and tn. of Lancashire, England, suburb of Oldham. Has important cotton and chemical manufs., and coal mines near. Pop. about 28,730.

Chaderton, Laurence (c. 1536–1640), Eng. theologian, b. in Lancashire; studied theology at Cambridge, in opposition to his father, who wished him to enter the law; and in 1584 was chosen by Sir Walter Mildmay as master of the newly refounded Emmanuel College. He assisted in the A.V. of the Bible.

Chaderton, William (c. 1540–1608), Eng. divine. After holding sev. important positions at Cambridge, he became bishop of Chester in 1579, being also appointed a commissioner for the discovery and conviction of popish recusants. In 1595 he was appointed bishop of Lincoln, where his efforts were still directed towards conformity.

Chads, Sir Henry Ducie (c. 1788–1868), Brit. naval commander, son of a naval captain. In 1810 he took part in the operations off Mauritius, being one of the party that seized the Ile de la Passe (see W. James, *Naval History*, 1866). First lieutenant of the *Jara* under Capt. Lambert when captured by U.S.A. frigate *Constitution*, 1812. Tried by court-martial for loss of this ship, 1813, but honourably acquitted. Commanded the *Alligator*, 1825, throughout the first Burmese war (1826). In 1845–54 captain of gunnery-ship *Excellent* at Portsmouth. Admiral, 1863. His son (1819–1906) was also an admiral. See W. R. O'Byrne, *Naval Biographical Dictionary*, 1849; *Memoirs by an Old Follower* (Montagu Burrows), 1869; T. Roosevelt, *Naval War of 1812*, 1882.

Chadwell St. Mary, par. of England, in Essex, on R. Thames, 10½ m. from Romford, 1½ m. from Tilbury Dock station. Contains the E. and W. India deep-water docks. Pop. 10,000.

Chadwick, Sir Edwin (1800–90), Eng. social reformer and statistician. He came from Manchester to London, studying at the Inner Temple, called to the Bar, 1830. He early studied social, sanitary,

and political science, and devoted his life to reforms, and prevention of pauperism and disease. In 1828 his article 'On Life Assurance' in the *Westminster Review* appeared; 1829 a paper 'On Preventive Police' in the *London Review*. These won him the notice and friendship of Jeremy Bentham. In 1834-47 he was secretary to the Poor Law commission. From evidence collected for this commission, C. wrote *Report on the Sanitary Condition of the Labouring Population of Great Britain* (1842). An earlier report of 1833 laid the foundations of later systems of gov. inspection. A public health Act was passed in 1848, and a general Board of Health appointed. C. was a member from 1848 to 1854. He was one of the founders of the Social Science Association, 1878. K.C.B., 1889. The society called Friends in Council (including Rowland Hill, John Stuart Mill, and others) was formed by C. to discuss political economy questions (c. 1844). C. advocated competitive examinations for gov. offices. See Sir B. W. Richardson, *The Health of Nations: a Review of the Works of Chadwick*, 1887; T. Mackay, *History of the English Poor Law*, 1899.

Chadwick, Sir James, b. 1891, Brit. physicist, now master of Gonville and Caius College, Cambridge. He was studying in Berlin when the First World War broke out and was interned, but allowed to continue with his work. Later he worked under Rutherford at Cambridge and took a prominent part in the researches that led to the modern ideas of atomic structure. In 1932 he demonstrated that what had appeared to be a penetrating radiation, produced by bombarding certain light atoms with α -particles, was in fact a stream of particles, of mass similar to that of the hydrogen atom nucleus, but uncharged with electricity. This discovery of the neutron was of immense importance for the understanding of atomic structure, since it soon became apparent that neutrons formed part of the central core or nucleus of all atoms. C. also shared in the discovery of the disintegration of the deuteron by β -rays, and of the creation of a pair of electrons (one positively and the other negatively charged) by β -rays. In 1932 he received the Hughes Medal of the Royal Society; in 1935 he received the Nobel Prize for physics and became prof. of physics at Liverpool. At the outbreak of the Second World War he began to study the chain reactions arising during the fission of uranium nuclei, and played a prominent part in the researches that led to the production of the atomic bomb.

Chærea, Caius Cassius, Rom. tribune of the praetorian cohort in Caligula's reign. He formed a conspiracy and assassinated that emperor. A.D. 41. Shortly afterwards he was executed by Claudius. See Tacitus, *Annales*.

Chæroneæ, anc.^t Gk. city Chæroneia, Boeotia, famed for the victory of Philip II. and Alexander of Macedon over Athenians and Thebans, 338 B.C. (see succeeding article), also for Sulla's defeat of the army

of Mithridates, 86 B.C. This city was Plutarch's bp., whence his sobriquet, the Chæronean Sage. Its ruins are near the present vil. of Kapræna, consisting of a temple, an aqueduct, and one of the most perfect remaining Gk. theatres. A colossal lion over the sepulchre of the Boeotians who fell in 338 B.C., mentioned by Pausanias, ix., was found much mutilated. It was restored and re-erected, 1905. See Murray's *Handbook for Greece*, 1884; Thucydides, iv.; Plutarch, *Alexander and Sulla in his Lives*; J. Krommayer, *Antike Schlachtfelder in Griechenland*, 1903-12.



THE LION OF CHÆRONEA

E.N.A.

Chæroneæ (Chæroneia), Battle of (338 B.C.). The details of this battle are not so well known to us as those of many less decisive conflicts in Gk. hist. In the Confederate host the Thebans held the right wing, the Athenians the left, while the Corinthians held the centre. In the Macedonian army the king faced the Athenians, and his son Alexander—a youth of eighteen who now saw his first battle—was opposed to the Thebans. Philip had decided to throw his greatest force against the enemy's right, for he dreaded the famous Boeotian phalanx. While he fought cautiously with the Athenians and even gave ground, Alexander delivered numerous furious onslaughts on the Thebans. The short spears of the Boeotians could not prevail against the long pikes of the Macedonian phalanx, and their cavalry was outnumbered and driven from the field. Theagenes, the Theban general, was

killed, the entire 300 chosen hoplites of the 'Sacred Band' fell to a man, and, finally, the Boeotians were routed by Alexander's cavalry. This was followed by the collapse of the Corinthians, who fled the field. The Athenians were now almost surrounded, so that flight was their only hope, and 2000 were captured and 1000 slain. The losses of the Thebans were even greater. Thus ended this famous battle, and 'once more the narrow spirit of local ambition had proved the evil genius of Greece,' and Philip, with Athens and Greece at his feet, had achieved his life's ambition (Oman).

Chærophyllum, genus of Umbelliferae, flourishes in N. lands of temperate climate. *C. temulum*, closely allied to the celery, parsnip, and carrot, is the chervil which is sometimes used as a pot-herb. *C. temulum* is the wild chervil, the garden species being *C. Sativum*. See also CHERVIL.

Chætoderma, genus of gastropod molluscs, forms by itself one of the two families in the div. Aplacophora. The species, of which there are three found in the Atlantic, Arctic, and Pacific Oceans, are cylindrical, covered with bristly spicules, and the sexes are separate.

Chætodon, genus of spiny-rayed fishes of the family Chætodontidae or Squamipennes. The body is laterally compressed and elevated, the snout is fairly long, the mouth is furnished with closely set rows of long, slender, bristle-like teeth, and there is one dorsal fin. The species are often remarkable for their beauty of colour, the commonest tints being black, yellow, and brilliant metallic blues and greens. Their food consists of small animals, and they are very adroit fly-catchers. The numerous species often frequent coral reefs, and are most often found in the Indian and Amer. seas, the Atlantic and Pacific Oceans.

Chæstognatha, very small div. of marine animals, consisting of the three genera, *Spadella*, *Khorota*, and *Sagitta*, the arrow-worm. The species are elongated, have caudal and lateral fins, are completely transparent, extremely numerous, and in habit they are carnivorous. The largest of these creatures is about 2½ in.

Chætopoda, class of Annelida, or segmented worms, in which the setae, or bristles, are very noticeable. The chætopods are divided into two orders, the Polychæta and the Oligochæta, according as the setae are borne on special processes called parapodia, or spring directly from the body. In the first order all the species are marine, with extremely few exceptions, and in most of them the sexes are distinct, while the second order is composed of hermaphrodite creatures which generally inhabit fresh water or live underground. Among the former may be mentioned the genera *Arenicola*, the lob-worm; *Aphrodite*, the sea-mouse; and *Chæloperus*; among the latter occur all the earthworms, e.g. *Lumbricus* and *Megascolides*.

Chætopterus, genus of annelid which is noted for its green phosphorescent glow. It is a curiously shaped worm which

inhabits a long tube. *C. variopeatus* is found on Brit. coasts and in all European seas.

Chaffer, name applied popularly to beetles of the family Scarabaeidae, which consists of about 13,000 species. The males have horns, and many of the perfect beetles and larvae are destructive to vegetable life. The term is usually compounded with another, e.g. cock-chaffer, barkchaffer, rosechaffer.

Chaffinch, or *Fringilla caelebs*, pretty, active little bird of the family Fringillidae, and is related to the sparrow, canary, and buntings. The cock-bird is a favourite songster, and from his note the Gers. call him *finck*, from which we derive the word finch; his specific name is obtained from the habit of the sexes of living apart in winter, the females migrating and leaving the celibate males behind.

Chagal, dist. of Baluchistan, N.W. of the Kharan State. Formerly an administrative div. of Brit. Baluchistan.

Chagall, Marc (b. 1887), Russian painter, b. at Liosno, Vitebsk. Studied painting under Bakst in St. Petersburg and (1910-1914) in Paris. Migrated to the U.S.A. in 1941. An artist of the Impressionist and Cubist schools, as may be seen from his 'Adam and Eve,' 'Parisian Self-Portrait,' and 'Paris through a Window.' His scenes of Russian folk-life are well known, as also his water-colours illustrating La Fontaine's Fables. See studies by T. Däubler, 1922, and A. Salmon, 1928.

Chagny, tn. of France, in the dept. Saône-et-Loire, 10 m. from Châlon-sur-Saône, 9 m. from Beaune. Has trade in wine, railway workshops, and quarries. Pop. 4800.

Chagos Archipelago, scattered group of coral reefs and islets in the Indian Ocean, S. of the Laccadive and Maldivé groups. They lie in circular form round the Chagos bank, in 5° 30' to 6° 30' N. and 71° 30' to 72° 30' E., separated from the Maldivé Is. by a deep channel 300 m. wide. Area about 150 sq. m. A dependency of the Brit. colony of Mauritius. The most important cluster is the Oil Is., with Grand C., or Diego Garcia, in the S.E. This is. has a good harbour, is a coaling-station, and exports much coco-nut oil. It is on the route of Australian and Red Sea steamers. Other is. are Danger, Egmont, Eagle, and Three Brothers Is. Various other is. S. and E. of the bank have disappeared. Pop. about 800 (400 in Diego Garcia).

Chagres River, in S. America (Colombia), flows W., then N. through isthmus of Panama, rising in San Blas Mts., about 30 m. from Panama, flowing into Caribbean Sea. Navigation is hindered by its falls and extreme swiftness, which also presented one of the main difficulties in constructing the Panama Canal. The Panama railway follows a part of its course.

Chahar, prov. of Inner Mongolia, China. Area 107,700 sq. m. Cap. Changchiakow. Pop. 2,034,000.

Chabtas, see CHOCTAWS.
Chaillé-Long, Charles (1842-1917), African explorer of Fr. parentage, b. at

Baltimore, graduated at Washington Academy, 1860; studied law at Columbia, becoming barrister, 1880; served in the Confederate army, 1862-65; went to Egypt and was made lieutenant-colonel by the khedive, 1870. In 1874 he became chief of Gordon's staff, and went on a mission to King M'tesa of Uganda. Obligated owing to plots to return to Gordon at Gondokoro, he managed to explore Lake Victoria and the country round, the course of the Somerset Nile, and Makaraka and Nyam-Nyam countries. He was decorated with many medals and honours for services as explorer and soldier. Among his works are *Les Combattants français*; *Les Sources du Nil*; *L'Égypte et ses provinces perdues*; *Central Africa: Naked Truths of the Naked People* (1876); *The Three Prophets* (1886); *My Life in Four Continents* (1912).

Chailletaceæ, obscure natural order of Dicotyledons flourishing in the tropics. The inflorescence is cymose, the flowers are hermaphrodite or unisexual, the calyx, corolla, and andræcium are in parts of five, the gynæceum consists of two or three united carpels, and the fruit is a drupe.

Chaillot, formerly a vil. in the immediate neighbourhood of Paris on the R. Seine. In 1859 it was called the suburb of 'la Conférence,' because the peace of the Pyrenees was decided upon after conferences there. Before the revolution there were two monasteries at C. In 1786 it became part of the precincts of Paris. The Trocadero Palace on the heights of Passy was rebuilt for the Paris Exhibition of 1937 under the name of the palace of C. The popular expression 'ahuri de Chaillot' (of unknown origin) meant a fool, a simpleton; 'envoyer à Chaillot', 'envoyer promener.'

Chaillu, Paul du, see DU CHAILLU.

Chain, or **Gunter's Chain**, measuring-line in land surveying, of 100 links (iron or steel rods, 7.92 in. long). Hence a lineal measure of 22 yds. Ten square chains make 1 acre (4840 sq. yds.). A surveyor's chain now is more commonly 100 ft. long (Ramsden's chain).

Chain, **Chain Cables** (Lat. *catena*), series of links of metal, or other material, so connected as to form a flexible band. Cs. are of very ant. origin, but the number of different uses to which they can be put has been largely increased in modern times. Some of the oldest uses are as ornament (collar, bracelet, cf. modern watch chain), as a symbol of office (cf. modern knight, mayor), and as fetters for prisoners or slaves, hence any kind of shackle or bond, or figuratively a restraining force. Cordage was used for many purposes now served by Cs. They are employed to confine, bind, fasten, or connect together various objects, to lift weights, to transmit a mechanical power. These last are known as pitch-Cs. In some Cs. the links are composed of a single piece of metal (oval-link holsting-C.). In others the links are made up of sev. separate pieces (bicycle-C.). These pieces are connected by bolts, rivets, or stud-screws, so formed as to engage with the teeth of a sprocket wheel.

They are partly machine- and partly hand-made. Cs. differ greatly in structure according to the shape of the links (stud Cs., open-link Cs., twisted-link Cs.), the mode of uniting them, and the purpose for which they are intended. They are sometimes loosely divided into hand-made and machine-made C. Ornamental Cs. may have a large variety of links, but those for useful purposes are mainly of two types: (1) stud Cs., in which a transverse stud or brace is inserted in each link to keep the sides from collapsing under strain; (2) open-link Cs. with no stud. The first are much stronger, increasing the load a C. can bear by about 50 per cent. Small Cs. are often made by machinery, but larger ones are usually made by a smith and entirely hand-wrought. Crane Cs. and ships' cables, etc., are generally hand-made from rolled bar-iron. The weld is commonly at the end of the link, but for large cables presses may be used to bend the link, or power hammers for welding, the weld sometimes being at the side. Weldless Cs. are machine-made ones, manufactured from cruciform steel bars pressed while hot into links with no join (Strathern's process). They are mostly made in small sizes for cow-ties, dog Cs., or fence Cs. Strong Cs. can withstand a breaking strain of many tons. C. cables have to undergo severe tests before passed by the Brit. Admiralty for use on board ship. Cs. for railways, cranes, dredges, etc. have similar tests. Size is defined by the diameter of the bar from which the links are made. A 2-in. stud C. cable must withstand a test-load of 72 tons. For full 'test requirements' see *Cent*, *Mechanical Engineer's Pocket Book*. As a nautical term C. means the contrivance to extend the basis of the lower shrouds of a mast, consisting of dead-eyes, C.-plates, and C.-wale ('channel').

Chained Books. The custom of chaining books to stands or reading-desks was very common in various parts of Europe in the fifteenth and sixteenth centuries. A library, fitted with reading-desks made with an iron rod along the top to which the books were fastened by a chain was founded at Zutphen, 1561, and is still to be seen. Later, as the number of books increased, upright book-shelves were set up (very much as in modern libraries) and the books so arranged in them as to show the fore-edges on which the titles were written. Sloping desks were placed in front of the shelves, and chains were fastened to the books long enough to allow of their being placed and consulted on the corresponding desks. All Saints' Church, Hereford, still possesses a library of this kind dating from 1715. Its cathedral library is an earlier example of the same system. In the reigns of the Tudor kings Henry VIII. and Edward VI., orders were given for Bibles and copies of the Paraphrases of Erasmus to be chained in the parish churches. These books, together with Foxe's *Book of Martyrs* and works of Jewell (d. 1571), may still be found in old churches with their chains attached

to them. The practice was discontinued early in the eighteenth century. It was doubtless first introduced because the scarcity of books made them very valuable. See W. Blades, *Books in Chains, and other Bibliographical Papers*, 1892; J. W. Clark, *The Care of Books*, 1901.

Chain-mail, flexible defensive body-armour of hammered metal links, much used in Europe in the twelfth and thirteenth centuries, and still in India and the interior of Asia. The links or rings were interlaced and connected by riveted links, so that each embraced four others, and wrought into the form of a garment. Though more convenient to the wearer than plate-armour, it was less adapted to withstand a lance's thrust.

Chain-plates, in shipbuilding, strong plates or bands of iron fastened to the ship's side under the chainwale, to which are attached the dead-eyes or (more recently) rigging-screws, to which the standing rigging and shrouds are fastened. In architecture, a series of connected plates built into walls to give greater strength.

Chain-shot, obsolete form of projectile, invented by Adm. de Witt in 1666, consisting of two balls connected by a chain or bar, and used to destroy the enemy's rigging.

Chairman, presiding officer at the meeting of any assembly, association, or company, whether convened for public purposes or for the transaction of the private business of the members. When a meeting is assembled the first thing to be done is for the chair to be taken. Some person present may have a statutory right to preside, and in the case of many public meetings, the name of the C. is previously announced in the notice convening the meeting. In the absence of the foregoing, or where the C. selected by the conveners of the meeting is challenged, the meeting should put the call to the chair to vote. The president or C. of the House of Commons is elected at the beginning of every new Parliament, and is called the Speaker. The prin. function of a C. is the maintenance of order, and on taking the chair a C. is consequently invested with authority to control and regulate the proceedings of the meeting. Generally speaking the duties of a C. are to decide points of order, put motions to the vote, call upon speakers to address the meeting, regulate the discussions, call upon the stewards or managers (if any), or the members themselves to eject interrupters without unnecessary violence, sign and secure the proper framing of the minutes, and adjourn the meeting. The Speaker of the House of Commons gives rulings as to procedure, names members guilty of disorder, reprimands members and other persons, if necessary, and signs warrants of commitment for contempt. Speakers at a meeting must always address the chair. Unless previously selected to speak, when he will be called upon to do so by the C., a member desiring to speak must rise at the end of another member's speech. If two or more rise simul-

taneously, the one that 'catches the C.'s eye' should be called upon; but the C. may call upon whom he will. The office of C. may not be an easy one to fill. The ideal qualities in a C. are urbanity, the most unimpeachable impartiality, and a clear perception of the fundamental rules of debate. In calling speakers to order his function is to keep a discussion within legitimate or relevant bounds. In the case of meetings of public bodies it is obvious that public time can only be saved by confining speeches to the questions on the agenda. The C. is the sole judge as to whether any speech, resolution, or amendment is in order. When any resolution or amendment is proposed and seconded the C. is bound to put the resolution or amendment to the vote. Where the voting is equal the C. may have a second or casting vote.

Chairman of Committees, the officer who takes the chair in the House of Commons when the House is in Committee and the speaker 'vacates the chair'. He holds office during the whole parliament. To the C. of C. belongs the duty of superintending all matters relating to private Bills. The salary of the C. of C. is £2500 a year. When the Speaker of the House of Commons is absent from parliament the C. of C. takes his place and the House of Commons also has a deputy-chairman.

Chaise, originally 'a chair' from the Fr., whence sedan-chair; then by transference a light, wheeled vehicle. Sometimes loosely used for any kind of pleasure-carriage. Usually a two-wheeled carriage for two people, with a calash top and the body hung on straps, drawn by one horse (*cf.* hansom). The post-chaise of the eighteenth and nineteenth centuries was a closed, four-wheeled vehicle, with two or four horses.

Chaitanya, Indian mystic (fl. c. 1486-1570). Founder of the Vaishnava sect of Bengal. Regarded by his adherents as Krishna incarnate.

Chalabre, tn. of France, situated in the dept. of Aude, arron. Limoux. It stands on the R. Lers, and lies S.W. of Carcassonne. Pop. 1600.

Chalaza, term in botany used in describing the internal structure of the ovule. The C. is the base of the nucellus, a mass of parenchymatous tissue from which the integuments arise.

Chalcedon, properly Calchedon (now Kadiköy), ant. Gk. city of Bithynia on the Bosphorus, opposite Byzantium, S. of Sentali. It was a Megarian colony, founded 685 B.C. For long it vacillated between Athenian and Lacedæmonian interests. Attalus III. of Pergamus bequeathed it to the Romans, 133 B.C. Partly destroyed by Mithridates, it was recovered under the empire. C. was frequently ravaged by barbarian hordes, such as the Goths (A.D. 256) and Persians under Chosroes (A.D. 616-26). In A.D. 451 the fourth general council was held here to determine the eccles. jurisdiction of the sees of Rome and Byzantium. It was destroyed by the Turks after 1075.

Chalcedony, or **Calcedony**, precious stone of the commoner sort, deriving its name from Chalcedon, a city of Bithynia in Asia Minor. The anct. mineral, however, appears to have been a green-stone, whereas modern C. is a milky-white or yellowish stone consisting of silica. It differs from quartz in not being definitely crystalline, but occurs in concretionary, mammillary, or stalactitic forms with a fibrous structure. Its hardness is 6.5 and sp. gr. 2.6. It occurs in cavities in volcanic rocks, where it has been deposited out of solution in water, as in the basalt of N. Ireland, Iceland, the Faroe Isles, etc. Occasionally specimens are found with a drop of water in the interior, and these are much prized as ornaments. C. has been worked by jewellers from early times, and variegated forms are differentiated as agate, onyx, jasper, bloodstone, carnelian, etc.

Chalcedonyz is a specially marked variety of chalcedony, a mineral composed of quartz of a milk-white colour caused by the presence of opal. It usually has greyish markings, which give it, when polished, an ornamental value, it being used for making brooches and vases.

Chalchicomula (San Andrés), tn. of Mexico, state of Puebla, 25 m. from Orizaba, near the foot of Orizaba peak. Pop. 7000.

Chalchihuitl (Chalchulte), Mexican name for a kind of green, fine-grained stone, quarried near Santa Fé, much prized by the anct. Mexicans. Probably it was a green variety of turquoise, or else a kind of jade. It was valued above gold, carved into rude figures and polished, or made into beads and ornaments. Figures were found in tombs, and the brooch fastening Montezuma's robe was of chalchihuitl.

Chalcides, name of a large genus of lizards in the family Scincidae. The species are pleurodont lizards with bony plates on the head and body, a scaly and feebly nicked tongue, elongated and sometimes serpentine body, the limbs wanting or little developed, and the lower eyelid has a transparent disk. They inhabit S.W. Asia and the Mediterranean. *Ch. ocellatus* attains a length of about 10 in.

Chalcidæum, in architecture, vestibule or portico of a public building; annex to a larger building (a basilica, or a modern church); a columned hall or covered portico in front of the chief entrance of certain buildings. In Gk. houses it was the part destined for guests or receptions. In Rom. basilicas they were side-annexes on each side of the tribunal. So called from Chalcis in Eubœa, which apparently first had such structures. The basilicas of Eumæstria at Pompeii, and of Constantine at Rome, had a C. placed at one end.

Chalcids, typical genus of the curious family of hymenopterous insects, Chalcididae. The family contains numerous species of tiny parasites which prey on the larvæ of gall, on caterpillars, on bees and beetles, but also on many destructive insects and they are thus of considerable

value to man. *C. flavescens* is a species which is native to tropical America, and certain hymenopterous insects of the allied genera *Blatophaga* and *Sychophaga* assist in caprification or the fertilisation of the cultivated fig.

Chaldis (Negropont), anct. seaport of Greece, cap. of Eubœa, on the Euripus at its narrowest part 17 m. from Thebes, 35 m. from Athens, to which it was subject in fifth and fourth centuries B.C. In early times it was a flourishing seat of commerce and manufs. (metal-work, purple, pottery), and a great colonising centre. The three-pronged peninsula of Chalcidice, projecting from Macedonia into the Aegean Sea and divided into Pallene, Sithonia, and Acte (with Mt. Athos), took its name from colonists in the eighth century B.C. from C., and its tns., Olynthus and Potidea, were famous in Gk. hist. Cumæ and Naxos were also colonised from there. In the seventh century it defeated Eretria in the Lelantine war, becoming chief city of Eubœa. Both Antiochus III. (192 B.C.) and Mithridates VI. (88 B.C.) used C. as a base for invading Greece. Aristotle d. here. C. was important in the Middle Ages; called Egripo by the Gks., Negroponte by the Its. It has medieval walls and towers, buildings of Venetian construction, and mosques mostly converted into Christian churches. In 1894 an earthquake did much damage. Since 1904 a railway connects C. with Athens and Piræus. Pop. about 11,000.

Chalcondylas (Chalcondyles), Demetrius (c. 1424-1510), learned Gk. grammarian of Athens. On Lorenzo de' Medici's invitation he went to Florence and taught there, his pupils including that prince's sons, Grocy, Linacre, and Latimer (1480-92). Prof. of Gk. also in Perugia, Rome, and Milan. The first printed ed. of Homer was ed. by C. (1488). His Gk. grammar, *Erotemata*, appeared about 1493. He also ed. Isocrates (1493) and Suidas (1499). See P. Giovio, *Elogia virorum bellica virtute illustrium*, 1551; J. A. Symonds, *Renaissance in Italy*, 1875-86.

Chalcondylas (Chalcondyles), Laonicus or Nicolaus (d. 1464), able Byzantine historian of the fifteenth century, son of an Athenian noble, relative (perhaps brother) of Demetrius C. (q.v.). During the siege of Constantinople (1446) Laonicus was ambassador from John VII., Palæologus, to Sultan Murad II. He wrote *History of the Turks and of the Byzantine Empire, from 1298 to 1463* (*De Origine et Rebus Gestis Turcorum*), ed. by Bekker, 1843. See J. A. Fabricius, *Bibliotheca Græca*, 1790-1809; J. von Hammer-Purgstall, *Geschichte des Osmanischen Reiches* (new ed. 1840; Eng. trans. 1854).

Chaldæa, Chaldæans (perhaps from Assyrian *kašadu*, to conquer), strictly a prov. of Babylonia, bounded by the lower course of the Euphrates, the head of the Persian Gulf and the Arabian desert. Its cap. was Bit-Yakin, chief seat of Merodach-baladan, who harassed Sargon and Sennacherib. In O.T. C., or Kas-

dim, is used in a wider sense to mean the whole empire of Babylonia (Gen. ii., Jer. i. 51). Ezekiel (xxiii.) includes certain foreign nations as well. Another name is *Mat Tamti* (Sea-land). The C. were probably a Semitic people from N. Arabia or the Kurdish uplands, and were the ruling class at Babylon as early as the eighth century B.C. Nabopolassar, or Nabuapaluzur (c. 626-604), and his successors made Babylonia a world power. From this time onwards the terms Babylonians and C. became more and more interchangeable, till finally they were considered synonymous as in the Hebrew writers. Labashi Marduk was the last Chaldean king (556);

Chaldir-gol, lake in Transcaucasia, 35 m. from Kars. Length, 12 m.; maximum breadth, 10 m.; area about 33 sq. m.; maximum depth, 140 ft. It abounds in fish (carp, trout, etc.), and is frequented by water-fowl.

Chaldron (another form of cauldron), Eng. dry measure; in London 36 heaped bushels, or its equivalent weight, nearly twice as much as Newcastle. Now only used for coal and coke (formerly only 32 bushels), now about 25½ cwt. In U.S.A. a C. is about 2940 lb., in New York, 2500. See Pepsy's *Diary* iii.; Steele, *Taller*, No. 73.

Chalet (dimin. of O.F. *chastel*, Mod. Fr., *château*), Swiss word, said to have been



SWISS CHALETS AT ZUM-SEE, NEAR ZERMATT

1 optical

the Babylonian Nabunaid succeeded him (555-38). According to some, the C. were a mixed race of Babylonians and Kassites or Cosseans. Besides being used as a race-name for Babylonians, C. in the book of Daniel (second century) meant astronomers, astrologers, mathematicians, and even magicians. This sense also appears in Herodotus, Diodorus, and Strabo. Xenophon's 'Chaldeans' (*Anab.* vii.) were an entirely different people from the Euxine. The Chaldean language seems to have been more like the Babylonian than like the Arabic or Aramaic. Daniel, however, speaks of Aramaic as 'the language of the C.' Hence, when the Babylonian tongue was superseded by Aramaic, Jerome wrongly called the latter 'Chaldee,' and this name was kept till quite recently. For recent archaeological research and bibliography, see under **BABYLONIA**; UR.

Chalder, old Scottish dry measure of 16 bolls or 64 firloths of corn (96 bushels). For lime or coal it varied from 32 to 64 Imperial bushels. Still used in computing the stipends of Scottish ministers (*cf.* **CHALDRON**).

introduced into France by Rousseau. Originally a wooden hut or cabin in the Swiss mts., where cattle are lodged in summer, and cheese is made. Extended to a Swiss peasant's small cottage, a herdsman's hut or wooden house. Applied now to any picturesque villa built in imitation of this style.

Chaleurs Bay (*Bale des Chaleurs*), sheltered inlet of the gulf of St. Lawrence, Canada, between Gaspé Peninsula and New Brunswick. Quebec is on the N., New Brunswick on the S. The bay is about 90 m. from E. to W., maximum breadth 25 m. There are good mackerel fisheries. Shippegan and Miscou Is. are near the entrance. Discovered by Cartier in 1535, it was named from the intense heat of the season.

Chalfont St. Giles, par. of Buckinghamshire, England, Wycombe div.; 3 m. from Chalfont Road station and Amersham, 10 m. from Windsor. Penn. is buried in the Friends' cemetery near. Milton lived there during the plague (1665-66), finished *Paradise Lost*, and wrote part of *Paradise Regained*. His cottage is still preserved and shown. Pop. 2000.

Chalford, eccles. dist. and vil. of Gloucestershire, England, 4 m. from Stroud, 1½ m. from E. Brinscombe station. Has dyeworks and broadcloth manufs. Pop. 3000.

Chalgrove (A.-S. *cealc-græf*, chalk-pit), par. and vil. of Oxfordshire, England, about 7 m. from Oxford, and 4 m. from Watlington station, Henley div. In 1643 the Parliamentarians were crushed here by the Royalists under Prince Rupert, Hampden being mortally wounded. Pop. 400.



Chaliapin, Feodor Ivanovitch (1873-1938), Russian basso, b. in Kazan, Russia. He was at different times, shoemaker's apprentice, railway clerk, railway out-porter, and stevedore on Volga steamboats. Trained in the choir of the archbishop of Kazan. At 17 joined a little Russian travelling company as singer and dancer. Ussatov, a singer of repute, volunteered to teach him, and later procured him an engagement at the Tiflis opera house; and he then made his operatic debut there in *A Life for the Tsar*. Later, he sang at St. Petersburg, taking the part of Ivan the Terrible in Rimsky-Korsakov's *Maid of Pskov*. His most valuable experience was, however, in Mamontov's company, in 1894-95, when he took Mephistopheles in *Faust*, the miller in Dargomizsky's *Russalka*, and Salleri in Rimsky-Korsakov's *Mozart and Salieri*. In 1896 at the Private Opera in Moscow, he became famous. He appeared in Moscow, in 1899, at the Imperial Opera and, in the same year, earned fresh laurels at Petrograd in the title-role in *The Demon* of Rubinstein and as Holofernes in Serof's *Judith*. Two of his best and favourite parts were Don Basilio in *The Barber of Seville* and Leporello in *Don Giovanni*. In 1908 he visited America, and in 1913 Sir Thomas Beecham brought him to London, where he appeared in *Boris Godunov* and *Khovanshchina*. He was again in London in 1921, and in America 1922-23. In 1928 and 1929 he appeared at Covent Garden in Boito's *Mefistofele*, Gounod's *Faust*, and Rossini's *The Barber of Seville*. In 1932 he was in the film, *Don Quixote*. Pub. *Pages from my Life* (1927); *Man and Mask* (1935).

Chalibaus, see CHALYBÆUS.

Chalice (Lat. *calix*), originally any drinking-cup, goblet, or bowl, but in this sense now only used in poetical language. Applied especially to the cup used in celebrations of the Holy Communion. Formerly it could be made of any material (the 'Luok of Edenhill' preserved in the family of Musgrave, near Penrith, is of glass), but must now be of gold, silver, or silver-gilt, and consecrated by a bishop in accordance with a prescribed form. It must be touched only by those in holy orders. The paten served as a chalice-cover and also to carry the wafer or bread. The C. is the emblem of St. John the Evangelist. The use of the 'mixed C.' (water mixed with wine in the Eucharist) in Rom. Catholic and Oriental churches dates from very early times. See Justin Martyr. *Apologia*, i.

Chalcotherium, genus of fossil pachydermatous animals, belongs to the extinct Ancylopoda, and has been discovered in the Miocene of Eppelsheim, near Mainz. Its limbs are tridactylate, and in dentition it lacks incisors, and has no canine teeth in the upper jaw.

* **Challi**, El, see HEBRON.

Chalina, genus of Porifera, received its name from the naturalist Grant. The sponge is represented in Britain by *C. oculata*, the mermaid's glove.

Chalk, soft, white variety of limestone. As found in the S. and E. of England, it is white or yellowish-white in colour and easily broken, though it varies considerably in compactness. Flints of various sizes are found embedded in the C., usually in fairly definite layers; otherwise it consists of calcium carbonate, with some admixture of silica, alumina, and magnesia. C. consists of the shells of minute animals called foraminifera. Different forms of these animals exist in all parts of the ocean, and are capable of developing shells for themselves from the calcium compounds found in the seawater. When the animals die, the shells combine with other debris to form an ooze in the ocean bed. At various periods in the earth's history, such masses of ooze, hardened by superincumbent pressure into rock, have risen above sea level, and thus we find that underneath the most recent formations a vast mass of C. exists throughout a great part of England and in those European coasts separated from England by the sea. The C. formation extends from the wolds of Yorkshire, with characteristic rounded hills and white sea-cliffs, to the N. and S. Downs in Kent, running westward until they merge in Salisbury Plain. Owing to its soft nature, the C. provides gently undulating scenery, a fine thin soil in which abundant grass grows suitable for sheep pasture, while the solution of the carbonate leaves behind numerous flints. Water in such localities is generally hard, owing to the amount of calcium carbonate in solution. The C. is used for building purposes when found hard enough, and the flints are used for building and road-making. When subjected to a bright heat, C. loses its carbon dioxide, and calcium oxide, or

quicklime, is formed. When mixed with water, the hydrate, or slaked lime, is produced, and this, mixed with three times its bulk of sand, forms the mortar used to cement bricks together. Lime is also much used as a manure, as it hastens the decomposition of organic constituents of the soil. C. burnt with certain proportions of clay provides different forms of cement, which harden with more or less rapidly according to the proportions of their constituents. C. is treated with acids to produce the carbonic acid gas required in the preparation of aerated waters, etc. When the C. is triturated with water, and the fine particles allowed to fall in a fairly homogeneous mass, the resulting product is whiting, used as a pigment and a polishing medium. An artificial C. is prepared by adding sodium carbonate to a solution of calcium chloride, when a fine precipitate forms. This product, known as precipitated C., is used in medicine as an antacid and astringent, and serves as a tooth-powder and as a pigment. Substances somewhat similar in consistency to the carbonate are known as Cr. *Black C.* is a soft schist containing carbon; *red C.* consists of iron ore and clay; *French C.* is a variety of steatite, or soapstone.

Chalkeley, Thomas (1675-1741), Quaker. After a varied and adventurous youth, he began preaching at Quaker meetings, and in 1697-98 visited the Puritan Amer. colonies. In 1700 he returned to America; in 1701 took a preaching tour to the Barbados, and between then and 1710 visited Ireland, Scotland, England, Holland, and Germany. The rest of his life was mainly spent in preaching and organisation in America, where he had great influence. His collected works appeared in 1751 and 1790.

Chalking the Door, mode of giving tenants notice of removal (especially among the poorer classes), long known and still in use in Scotland. The chalk-mark is made by a burgh officer in the presence of witnesses on 'the most patent door,' on the proprietor's verbal order. This is done forty days 'before Whit Sunday,' or the date on which the tenants are expected to leave. When this has been done, and a declaration of 'chalking' been written out and signed by the officer and two witnesses, he may demand the ejection of the tenants six days after the expiry of the forty days.

Challemeil-Lacour, Paul Amand (1827-1890), Fr. publicist and statesman; prof. of philosophy at Pau and Limoges. In 1868 he estab. the *Revue Politique*, with Brisson and Gambetta, who made him prefect of Lyons. 1871; deputy, 1872; senator, 1876; ambas. to Switzerland, 1879; to England, 1880-82. In 1883 under Ferry, he was minister of foreign affairs, in 1890 becoming vice-president, and in 1893 president of the Senate. C. founded the *République Française* with Gambetta, becoming editor-in-chief. Member of Fr. Academy, 1893. He wrote philosophical works: *La Philosophie individualiste* (1864);

trans. of Ritter's *Geschichte der Philosophie* (1861). He also ed. Mme d'Épinay's *Works* (1869). His *Œuvres oratoires* appeared in 1897.

Challenge, see **JURY**.

Challenger Expedition, scientific exploring expedition sent out by the Brit. Gov. (1872-76) for experiments in deep-sea soundings and the investigation of the conditions of life in the Atlantic, Pacific, and Antarctic Oceans. The cruise of H.M.S. *Challenger* followed that of the *Lightning* in 1868, and of the *Porcupine*, 1869-70. Capt. Nares was naval commander of the vessel, the scientific staff being under Prof. Wyville Thomson. Every kind of scientific appliance was supplied for sounding the depths, mapping the basins, and determining the physical and biological conditions of the oceans. H.M.S. *Challenger* reached Santa Cruz in Feb. 1873. Investigations were made at 362 stations. Among numerous places on the route were Madeira, Canaries, W. Indies, Nova Scotia, Cape Verde, Fernando Noronha, Cape of Good Hope, Melbourne, Hong Kong, Japan, Valparaiso, Magellan Straits, Portsmouth. The deepest sounding was between Admiralty Is. and Japan, 4575 fathoms. See *Official Reports on the Scientific Results of the Voyage of H.M.S. Challenger*, ed. by Wyville Thomson and John Murray, 50 vols. (Zoology, Botany, Deep-sea Deposits, Physics, and Chemistry, etc.), 1880-95. The narrative occupies 2 vols. (1882-85). Consult also H. N. Moseley, *Notes by a Naturalist on the Challenger*, 1872-76, 1879; W. J. J. Spry, *Cruise of H.M.S. Challenger*, 1876; and works of W. Thomson, J. Murray, Lord George G. Campbell, and J. J. Wild.

Challis, James (1803-82), Eng. astronomer and physicist, educated at Trinity College, Cambridge. Senior wrangler, first Smith prizeman, 1825; ordained 1830. In 1836 Plumian prof. of astronomy and experimental philosophy, and till 1861 director of the observatory of Cambridge Univ. His labours were largely directed to determining the positions of the sun, moon, and planets, so as to increase tabular accuracy. Among his valuable improvements were the collimating eye-piece (1850), the transit-reducer, and the meteoroscope. He contributed largely to scientific publications, and also produced independent works on astronomy, physics, and mathematics, among them being *Astronomical Observations*, 1828-35 (1829-50); 1846-51 (1854-56); in *Essay on the Mathematical Principles of Physics* (1873). See Adams, *James Challis*.

Challoner, Richard (1691-1731), Eng. Rom. Catholic divine, educated at the Eng. college at Douay, 1704; prof. of philosophy there, 1713-20; vice-president and prof. of divinity, 1720-30. C. returned to London, becoming coadjutor to Petre, titular bishop of London, 1741, succeeding him in 1758 as vicar-apostolic. He was bishop of Debra in Libya, 1741. During the Gordon riots he took refuge in Highgate. He pub. theological and polemical works, among them *Church*

History; Grounds of the Old Religion; The Garden of the Soul (1740); *The Rheims New Testament and the Douay Bible, with Annotations* (1749-50). His version of the Douay Bible is substantially that since used by Eng.-speaking Catholics. C. also trans. *The Imitation of Christ* (1706). See Barnard's life (1784).

Chalmers, Alexander (1759-1834), Scottish biographer and editor, educated in Aberdeen. He ed. sev. newspapers in London (*Morning Herald*), contributed to periodicals, but chiefly wrote prefaces for new eds. of Eng. classics (Shakespeare, Johnson, Fielding, Warton, Gibbon, Burns, Pope, Bolingbroke, and others). His *Glossary to Shakespeare* appeared in 1797. His *British Essayists*, in 45 vols., 1817, is still useful. His fame chiefly rests on his *General Biographical Dictionary* in 32 vols. (1812-17).

Chalmers, George (1742-1825), Scottish antiquarian and historian, educated in Aberdeen and Edinburgh. Emigrated to America, 1763, practising law in Baltimore till the revolution. From 1787 was chief clerk of the Board of Trade in London. His chief work is *Caledonia; or, an Account of North Britain* (1807-24). Other works were biographies of Defoe (1785), Thomas Paine (1791), Mary Queen of Scots (1818), also a *Collection of Treaties* (1790), and works on the colonies.

Chalmers, George Paul (1833-78), Scottish painter, in early life a surgeon's errand-boy, then apprentice to a ship-chandler. He determined to become an artist, coming to Edinburgh, 1853, and studying under Scott Lauder. Orchardson, Graham, Pettie, and others were among his fellow students. Among his first works were small figure pieces in oil, 'The Student,' and 'The Smoker.' His 'Favourite Air' won notice, 1854. His colouring is rich and powerful, his portraits very good. His beautiful landscapes mostly appeared in his later years, including 'The End of the Harvest' (1873); 'Running Water' (1875). Other works are 'The Legend' (Edinburgh National Gallery); 'Prayer' (1871), both etched by Rajon; 'Threescore Years and Ten' (R.A., London, 1875); 'Knitting' (1876); 'The Love Song'; 'The Potato Harvest.' See *Memoir*, 1879; *Art Journal*, April 1873.

Chalmers, James (1841-1901), Scottish missionary, served in Glasgow City Mission, passed through Cheshunt College, and was appointed by the London Missionary Society (1866) to work in Raratonga Is. in the S. Pacific. He worked there for ten years, especially training native evangelists, and called by the natives Tamate. Then he was transferred to New Guinea. Besides zealous missionary work, C. and Lawes (his colleague) did much as explorers to open up the land, and helped in establishing the Brit. protectorate. C. and Tomkins (another missionary) were murdered by cannibals at Goaribar, Is. See R. L. Stevenson, *Letters*, II. 212, 220; J. Chalmers: *Autobiography and Letters*, ed. by R. Lovett, 1902.

Chalmers, Thomas (1786-1847), Scottish

theologian and economist, one of the most eminent figures and influential preachers of the nineteenth century. His powers of oratory were so great that Jeffrey ranked him with Demosthenes, Cicero, Burke, and Sheridan. Educated at St. Andrews Univ., he began preaching at nineteen. From 1803 to 1815 was minister of Kilmany, Fife. He then gave much time to studying mathematics, political economy, and natural philosophy, but after reading Wiltberforce's *View of Practical Religion*, and writing at his request the article on Christianity for Brewster's *Edinburgh Encyclopædia*, 1810, his spiritual nature was aroused, and he became an enthusiastic pastor. In 1815-20, as minister of Tron par., Glasgow, he tried to remedy the ignorance and vice of his par., making experiments in parochial organisation which may be said almost to have suggested modern methods of dealing with the dependent classes, as seen in charity organisation societies and in settlement work. See N. Masterman, *Chalmers on Charity*, 1900. C. divided the par. into twenty-five dists., and estab. two week-day and numerous Sunday schools. His *Astronomical Discourses* appeared in 1817, and were very popular. His visit to London was enthusiastically received. His *Christian and Civic Economy of Large Towns* appeared from 1821 to 1826. These energetic labours told on his health. In 1823 he became prof. of moral philosophy at St. Andrews; 1828 of theology at Edinburgh. In 1827 appeared the *Use and Abuse of Literary and Ecclesiastical Endowments*; in 1834 his Bridgewater treatise, *Adaptation of External Nature to the Moral and Intellectual Constitution of Man*, which won him great distinctions from Edinburgh, France, and England (D.C.L., Oxford). In 1829 C. delivered a speech on Catholic emancipation. He was elected moderator of the General Assembly of the Scottish Church, and convener of the church-extension committee (1834). Cases of conflict between the church and civil authority arose in Auchterarder, Dunkeld, and Marnoch. In 1843, owing to these internal troubles, 470 clergymen, headed by C., left the church and founded the Free Church, claiming for it spiritual independence. C. was made prin. of the Free Church College. He devoted much time to the attempt to abolish pauperism round about Edinburgh. His last work was *Institutes of Theology*. Other works are: *An Enquiry into the Extent and Stability of National Resources* (1808); *Commercial Discourses* (1817); *Political Economy* (1832); *Defence of Church Establishments* (1838). His works were collected by W. Hanna 1836 40, and posthumously 1847-49. See R. Buchanan, *The Ten Years' Conflict*, 1849; W. Hanna, *Memoirs*, 1849-52; Taylor Innos, *Law of Creeds in Scotland*, 1867; Mrs. T. C. Oliphant, *Thomas Chalmers*, 1898; W. G. Blaikie, *Life*, 1897.

Chaloner, Sir Thomas (c. 1520-65), Eng. statesman and writer, educated at Oxford, sent by Henry VIII. as ambas. to Charles V., whom he accompanied in

his disastrous expedition against Algiers, 1541. Recalled to England as chief clerk of the Privy Council; knighted for his services at Musselburgh, 1547. As a Protestant he was driven from office in Mary's reign. Elizabeth sent him as ambas. to the Emperor Ferdinand I. of Germany, 1558, to Philip II. at Courtray, and as minister at the Sp. court, 1561. Among his works are *Office of Servants* (trans. from Cognatus, 1543); trans. into Eng. of St. John Chrysostom's homilies (1544); *De Republica Anglorum Instauranda* (1544); *Miscellaneous* (Lat.) *Poems* (1559); *Carmen Panegyricum* (1560); and trans. of Erasmus's *Praise of Folly* (1549).

Chaloner, Sir Thomas (c. 1561-1615), Eng. naturalist, son of the statesman, father of Edward, James, and Thomas the regicide (d. 1662). A favourite of James I., he came with him to England after a visit to Scotland, and in 1603 was appointed director of the education and household of Prince Henry. He founded a grammar school at St. Bees, 1608, where two C. scholarships still exist. He opened the first Eng. alum-mines at Belman Bank, Gulsborough, about 1600. C. wrote *A Short Discourse of the most rare Vertue of Nitre* (1584).

Châlons-sur-Loire, tn. in the dept. of Maine-et-Loire, France, 12 m. S.W. of Angers. The chief trade is in wines, grain, and limestone. There are mineral springs in the neighbourhood. C. possesses the ruins of a twelfth-century château. Pop. 3400.

Châlons-sur-Marne, cap. of the dept. of Marne, France, 107 m. E. of Paris by rail, situated on the r. b. of the R. Marne. C. is a garrison tn., surrounded by old walls. Many of its houses are old and built of timber, and the cathedral of Saint-Étienne, famed for its altar, dates back to the thirteenth century. C. has some handsome public buildings—the hôtel-de-ville, communal college, museum, and library, etc.—and a fine park, the Promenade du Jard. It has trade in woollens, leather, grains, oil, and champagne, but the manuf. of 'shalloon,' a kind of worsted cloth, mentioned by Chaucer, had fallen into disuse before 1939. C. was known to the Romans as Catalaunum; it was the site of the defeat of the Huns by the combined forces of Romans and Goths in 451; it suffered at the hands of the Eng. (1430-34) and of the Prussians (1814), and in 1870 was taken by the Gers. during the Franco-Prussian war, when MacMahon withdrew from the famous camp of C., formed by Napoleon III. in 1856. And again in the First World War, when Marshal Joffre withdrew his left wing during the Ger. offensive of Aug. 1914, he pivoted the movement on Verdun, hoping to hold the enemy on the R. Aisne. But this he could not do owing to their overwhelming numbers, and the Gers. pressed southward towards the Marne. Here also they could not be held, and C. was abandoned to them on Aug. 28-29. The enemy was, however, brought to a standstill on line just S. of the Marne. Joffre had

already entrusted the formation of a new army to Gen. (later Marshal) Foch, and it was Foch's Ninth Fr. Army that opposed the Gers. opposite C. and followed hard on their heels into the tn. when they retreated northwards during Sept., 1914. C. was not again visited by the enemy during the war. In the Second World War C. fell to the Gers. early in June 1940, in their headlong rush to the Seine. Gen Patton's (q.v.) troops crossed the upper Marne near Vitry-le-François on Aug. 29, 1944; on the next day the 4th Armoured Div. of 12th Corps moved on to Saint-Dizier, while to the N. the 80th Infantry Div. captured C. and advanced rapidly northward. Pop. 31,100.

Châlon-sur-Saône (anct. Cabillonum), the cap. of an arron. in the dept. Saône-et-Loire, France, situated on the r. b. of the R. Saône at its junction with the Canal du Centre. There are fine quays along the river-side, and the tn. has a prosperous trade with the Atlantic and Mediterranean. Its chief manufs., before the Second World War were glass, pottery, paper, hosiery, umbrellas, and jewellery; there are also copper and iron foundries and shipbuilding works. Pop. 32,600.

Chalus (Castrum Lucii), tn. of France in Haute-Vienne, on R. Tardoire, 17 m. from Limoges. The upper tn. contains ruins of the castle where Richard I. was mortally wounded, 1199. Near by is the ruined fortress of Montbrun. Pop. 2700.

Chalybeus (Chalybæus), Heinrich Moritz (1796-1862); Ger. philosophical writer, taught for some years; 1839-52, prof. of philosophy at Kiel Univ. where, with the exception of one brief interval, he remained till his death. In 1836 he pub. *Historische Entwicklung der speculativen Philosophie* (Kant to Hegel). But his chief works are *Entwurf eines Systems der Wissenschaftslehre*, 1846, and *System der speculativen Ethik*, 2 vols., 1850. His general principle, 'ideal-realism,' rejects both the extreme realism of Herbart and what he regards as the one-sided idealism of Hegel; and he tries to find a mean between the two. He defines the 'world ether' as the infinite in time and space and which in his view must be postulated as necessarily coexisting with the Infinite Spirit or God.

Chalybeate Springs are natural mineral waters in which iron predominates, as at Harrogate and Leamington Spa, England. The iron is generally combined with carbonic acid, in the form of protoxide or proto-carbonate, or with sulphuric acid, in the form of sulphate of iron, and the springs, therefore, can be subdivided into carbonated chalybeate and sulphated chalybeate.

Chalybes (Gk. χάλυβες, from χάλυψ, steel), Asiatic people who lived in Pontus, Asia Minor, S.E. of Black Sea. Famed as ironworkers, whence our word 'chalybeate.' Also a people near the headwaters of R. Euphrates in anct. times.

Chalybite, see **SIDERITE**.

Cham (Heb. for Ham, son of Noah) (1819-84), pseudonym of the brilliant caricaturist, Amédée Charles Henri, Vicomte de Noé. He studied under

Delaroche and Charlet, and won fame for depicting the humorous side of contemporary Parisian life, his first album, *Calebours, bêtises, jeux de mots tirés par les cheveux*, appearing 1842. In 1843 he first became connected with *Charivari*, and in this and the *Journal des Pèlerins* his drawings continued to appear till his death. His masterpieces are chiefly social, but he also did political cartoons. Among his skits are *Proudhomans*, *Baigneurs et buveurs d'eau*, *L'Exposition de Londres*. For collections of his comic sketches see *Douze Années comiques* (1880); *Les Folies parisiennes* (1883). There are also examples in G. A. Sala's *Paris Herself Again in 1878-79*, 1882. See F. Ribeyre, *Cham, sa vie et son œuvre*, 1884.

Chamæleon, small S. constellation near the S. pole between Hydrus and Argo, announced by Bayer in 1603.

Chamerops, genus of palm-trees, consists of only two species, both Mediterranean plants, and *C. humilis* having the peculiarity of being the only European palm. In Britain it is frequently cultivated in hothouses, where it grows to a height of 15 ft., but in Spain it grows in the open to about 4 or 5 ft. only, and in Italy it is smaller still. The trunk is 5 or 6 in. in diameter, and the fan-like leaves grow in a tuft at the top.

Chamalhari, or **Shumalari**, peak of the Himalaya Mts., over 23,930 ft. high, between Tibet and Bhutan, E. of Sikkim, 140 m. from Mt. Everest, rising above the main route from India to Gyantse.

Chamba, or **Chumba**, native tribal state of India, also chief tn. of this state on the Ravi, at the foot of the Himalayas, 120 m. from Lahore. Bounded N.E. by Kashmir, Kāngra and Gurdaspur on the S. Produces wheat, millet, rice, Indian corn, hops, wax, nuts, honey, and timber. Iron ore and slate quarries abound. A favourite resort of sportsmen, it contains the Brit. sanatorium of Dalhousie. Area, 3180 sq. m. Pop. 170,000.

Chambal, or **Chumbal**, riv. in Central India, trib. of the Jumna R., rises in the Vindhya Range (2019 ft.) and flows 650 m. in a N.E. direction to its junction with the Jumna, 90 m. S.E. of Agra.

Chamber of Commerce, association of merchants, bankers, and others associated with trade for the purpose of promoting trade interests directly and by appeals and representations to the gov. Such associations also furnish statistics with reference to the dists. to which they belong, and comparative statistics of trade generally. A C. of C. may also be called upon to decide issues in mercantile questions. Thus, e.g., the London C. of C. and the Corporation of the City of London estab. in 1892 a joint board of twenty-four members (twelve from each body) who appoint arbitrators to adjudicate on commercial disputes that may be submitted to them. Important provincial Cs. of C. which perform this service include those of Manchester and Dublin. The oldest C. of C. is said to be that of Marseilles, which was founded in the fourteenth century and acted as a court

of arbitration in mercantile affairs. At the beginning of the eighteenth century chambers were organised at Lyons, Rouen, Toulouse, Bordeaux, etc., but were abolished at the close of the century. At the beginning of the nineteenth century these Cs. of C. in France were re-instituted. The objects of the Fr. chambers are to mediate with the gov. for the purpose of promoting trade, and to advise with regard to public works whose construction or alteration affect the progress of trade. The members of these associations are elected by the chief merchants of the dist. selected for that purpose by the prefect. The Fr. Cs. of C. are of a quasi-official character, and, in that respect, unlike the Brit. Cs. of C. An illustration of the wide powers vested in them is provided by the fact that, during the First World War, they issued paper money and token coinage to meet the lack of small change then existing. This issue, which was also made by the municipalities, was liquidated only ten years after the cessation of hostilities. The oldest Brit. chamber is that of Jersey, which was founded in 1768. The chamber of Glasgow was instituted in 1753, Dublin chamber was founded in 1785, Edinburgh in 1786, Manchester in 1794, Belfast in 1796, Birmingham in 1813, Newcastle-upon-Tyne in 1818, and Liverpool in 1851. The London chamber, though most important to-day, was only instituted in 1881; it has a large direct and indirect membership. The chamber is divided into numerous depts. The largest section of the London C. of C. consists, as is the case generally, of merchants, these numbering about 3500, while manufacturers number approximately 3000. The balance is made up of banking, insurance, and transport interests, together with certain brokers and agents. The activities of this chamber, which is situated at 69 Cannon Street, E.C.4, are multifarious, there being as many as seventy sections. Not the least important of those activities is that concerned with the supply of suitable labour for its members' businesses, the larger part naturally being clerks. The teaching of book-keeping, modern languages, and other commercial subjects is encouraged by grant of certificates of efficiency, after examinations, for which many thousands of students sit. Each dept. has a chairman and committee. The general council approves the measures adopted by the depts. The Edinburgh C. of C. was largely responsible for the repeal of the Corn Laws and the adoption of Free Trade; it petitioned for the construction of the Suez Canal, and advocated the control of the telegraph system by the post office. The Manchester chamber was energetic in the cause of Free Trade. Throughout Great Britain there are now similar bodies in all the important mercantile centres. An association of Cs. of C. of the United Kingdom was instituted in 1860, and membership is entirely voluntary. The general association meets in London in March of each year, and the decisions of this assembly have great

weight in Parliament. When this national body was founded it was constituted by sixteen chambers, but to-day practically every important chamber in the country is affiliated. There is also a body called the Federation of Cs. of C. of the Brit. Empire. This was founded in 1911, under the name of the Brit. Imperial Council of Commerce. It holds congresses every three years and its membership consists of nearly 200 chambers or associations of chambers. The Association of Brit. Cs. of C. is naturally a constituent of the international association of Cs. of C. There are also independent Brit. Cs. of C. in foreign countries, which play an important part in promoting trade. Those in Paris, and other European caps. (after the Russian Revolution the C. of C. of St. Petersburg, or Leningrad, disappeared and that in Berlin was dissolved by the Second World War), are especially influential in this connection, while those in great S. Amer. cities have a high standing. These bodies, like those in Great Britain, are entirely voluntary and enjoy no gov. subvention. In the Brit. colonies there are also important Cs. of C. in the important mercantile centres. The oldest colonial chamber was that founded in New York City in 1768 before the Amer. colonies broke away from the motherland. This chamber, incidentally, may be said to have been the model for future Amer. Cs. of C., or Boards of Trade as they are sometimes called. A chamber was founded next at Cape Town, S. Africa, in 1804, a few in India between 1830 and 1840, while the first C. of C. in Australia and Canada were estab. respectively in 1840 and 1845. In the dominions these chambers are now federated and both Canada and Australia now have their own C. of C. in London. Congresses of colonial and Brit. delegates have been held from time to time, and thereby afford an opportunity to the colonial boards to appeal to the home chambers. In 1916 was founded in Great Britain the Federation of Brit. Industries (*q.v.*), a federation of trade associations, chiefly manufacturing, which to some extent supplements and in some cases supersedes the work of the Association of Brit. Cs. of C. The Cs. of C. in the U.S.A. often partake of the characteristics of both the Brit. Cs. of C. and the Federation of Brit. Industries, *i.e.* they are associations of merchants and of trade associations. The first Amer. C. of C. to be estab. abroad was one at Liverpool in 1801. There is also one in London and one in Paris. France also maintains Cs. of C. in London and Liverpool.

Chamber of Shipping of the United Kingdom includes most of the ship-owners' associations of the United Kingdom. It communicates with the chief gov. depts. on all matters affecting the interests of Brit. merchant shipping. In 1929 the chamber passed resolutions in favour of an international load-line agreement, and a uniform standard for safety of life at sea. Its affairs are managed by an executive council to which each affiliated association elects one or more

members. Its offices are at 3 Bury Street, London, E.C.3.

Chamberlain, officer attached to the court of a monarch, appointed by a king, nobleman, or corporation to perform domestic and ceremonial duties. In Great Britain this office dates from very early times. The C. was one of the chief officers of state from the thirteenth century; 1406 Parliament declared that he must be a member of the council *ex officio*. Hence he had originally considerable share in the responsibilities of gov., and though this is no longer the case, he remains an officer of very high standing in the royal household. The Lord C. has control over all officers, servants (except those of the bed-chamber), physicians, musicians, comedians, and tradesmen connected with the royal household. In 1782 he became the provider of state robes for the royal family, household, and officers of state. Cards of admission to royal functions (levees, drawing-rooms, balls) must be obtained from him. He endorses the king's answer on petitions, and often communicates His Majesty's pleasure to Parliament and the council. Theatres in tns. containing a royal palace have to be licensed by the Lord C.; no new play can be performed without his sanction. Much discussion has been raised on this point (*see CENSORSHIP OF THE DRAMA*). The examiner of plays is a leading member of his staff. His salary is £2000 a year, tenure of office depending on that of his political party. A vice-C. as deputy and assistant has existed from the time of Richard II. Other state officials are the Lord Great C. and City C. (of various corporations). *See Anson, Law and Customs of the Constitution*, 1896.

Chamberlain, Arthur Neville (1869-1940), Eng. statesman, b. at Birmingham, youngest son of Joseph C., and only son of his mother, Florence Kenrick, second wife of Joseph C. Educated at Rugby and at Mason College, Birmingham (later known as Birmingham Univ.). He managed an estate in the Bahamas, 1890-97; returned to be a manufacturer in Birmingham; entered Birmingham City Council, 1911, and became chairman of the town planning committee and an alderman, 1914. During the First World War he was member of the Central Control Board (Liquor Traffic) 1915, and director-general of national service, 1916-17—he resigned this office on account of objection to his schemes, which were deemed to amount to industrial compulsion. C. was also lord mayor of Birmingham, 1915-16, and took a leading part in the estab. of the municipal bank, which began as a war-time expedient. In Dec. 1918 he was elected Conservative M.P. for the Ladywood div. of Birmingham; Privy Counsellor and postmaster-general in the Bonar Law ministry, in 1922; paymaster-general, 1923. When Baldwin replaced Bonar Law as Prime Minister, C. entered the Cabinet as minister of health. Only a few months later he became chancellor of the exchequer. This series of meteoric promotions,

remarkable in the case of a man who had not entered public life till he was past forty, was in a measure justified by the general recognition of his notable gifts for parl. debate. It was by his persuasion that Baldwin dissolved Parliament in Oct. 1923 on a tariff reform appeal, and though the resulting defeat postponed tariff reform, it reunited the Conservative party, which soon returned with a solid majority. C. was naturally asked to resume the chancellorship of the exchequer, but he preferred to be minister of health and he made of that ministry



Eliott & Fry

NEVILLE CHAMBERLAIN

a leading dept. of state. Indeed nearly all the chief measures of the Baldwin Gov. in the domestic sphere were prompted or executed by C. He became chancellor of the exchequer again in the National Gov., 1931, in succession to Snowden, and his first policy was to carry protection. In all C. introduced big budgets, and his policy was to refuse large state expenditure on public works and to restore confidence by economy, by raising wholesale prices, and by fostering easy credit and low rates of interest. He differed from the old *laissez-faire* school in that he desired large state expenditure on social reform, but only if private enterprise created the requisite wealth. At the Lausanne conference on war debts he argued unsuccessfully for 'cancellation all round' and later that year took a leading part in negotiating the Ottawa Economic Conference agreements with the dominions. His hopes for a great programme of social reform were now, however, dashed by the menace of inter-

national security and the need to think of rearmament. It was on his advice that the gov. capitulated to Mussolini on the question of sanctions over the war with Abyssinia, but he was probably justified in throwing the blame on the League of Nations. In Feb. 1937 he announced the gov.'s decision to spend £1,500,000 on rearmament. On May 28, 1937, he succeeded Baldwin as Premier. Early in 1938 he came into conflict with his foreign secretary, Mr. Eden, over his decision to negotiate an agreement with Italy, Mr. Eden insisting that Italy must first withdraw her invading armies from Spain. C. carried his Cabinet with him and Mr. Eden resigned. Mr. Eden's justification lay in the fact that C. had to promise Parliament precisely what Mr. Eden had demanded, and the Anglo-It. Agreement made by C. therefore remained a dead letter. The gov. also sacrificed principle by recognising the It. annexation of Abyssinia. This was in fact the beginning of the 'appeasement policy' with which the memory of C. must ever be associated. Himself comparatively a novice in foreign affairs, he had an instinctive distrust of the Foreign Office experts and was largely his own foreign secretary. After the Ger. annexation of Austria and when Czechoslovakia was by implication threatened with a like fate, C. refused to follow Russia and France in giving guarantees to Czechoslovakia, but shortly afterwards, when Hitler concentrated his forces against that country he took a firm line and Hitler held off. But towards Italy C. remained lenient, and when Mussolini resumed his attacks on Brit. shipping and sent more divs. to Spain he did nothing. Meanwhile the pace of rearmament and the organisation of A.R.P. (q.v.) was slow in the extreme, but C. thought that by patient activity in peace-making he could exorcise the demon of international armed conflict. Having scored one arguable success, the agreement with do Valera to call off the economic war and surrender Brit. control of the Irish naval bases, he sent Lord Runciman to Prague to mediate between the Czechs and the Sudeten Gers. (see further under CZECHOSLOVAKIA). War seemed inevitable and C. then took the unprecedented step of going, together with Sir Horace Wilson (the gov.'s industrial adviser), by plane to Berchtesgaden to see Hitler. As he was now sixty-nine and had never flown before, the world saw an element of the heroic in this personal dash for peace. C. acceded to Hitler's damaging demands and carried both the Brit. and Fr. Cabinets with him. At a second meeting with Hitler at Godesberg Hitler naturally raised his price and even C. shrank from compliance. War seemed imminent but, on the intervention of Mussolini, C. and Hitler were once again brought together—this time at the notorious Munich four-power meeting (see MUNICH PACT) which in effect threw the Czechs overboard. C. deluded himself by bringing back a worthless signature to a treaty of permanent friendship between Germany and

Britain. He announced that he had 'brought back peace with honour' and he believed that it was 'peace for our time'; and he compared his home-coming to that of Beaconsfield from Berlin in 1878. He was acclaimed everywhere, and though disillusionment soon followed with the increasingly bellicose tone of Ger. political utterances, C. continued to point to his various international agreements as vindications of his policy of appeasement. On Feb. 28, 1939, he announced in the Commons the unconditional recognition of Franco—a logical sequel to his gov.'s policy in withholding arms from the republicans—and repeated his conviction that Germany had no aggressive intention. On Mar. 10 he gave out a statement that the international outlook was fair; but five days later Hitler dropped the mask and invaded Czechoslovakia. C. at length turned, rebuked Hitler for his perfidy, gave a guarantee to Poland and, still later, guarantees to Rumania and Greece. It is no doubt true to say that C.'s part in the Munich Pact gave Britain a year in which to make good her defences; but C.'s rearmament did not even keep pace with that of Germany, and on Sept. 1, 1939, Germany's lead in air strength was much greater than at the time of Munich. It was only in May that C. at last consented to waive his prejudice against the formation of a Ministry of Supply. Himself a quick and businesslike administrator, he neither filled ministerial posts with able ministers nor had the power to drive others. Indeed, he felt so confident that the country had made good its shortcomings that he manifested his complacency in an address to his party adherents on April 4, when he told the world that Hitler, by not attacking, had 'missed the bus'—in which piece of optimism, however, he was but re-echoing a very similar utterance previously made by Gen. Ironside, then chief of staff. C.'s Gov. did not long survive the opening of the war. The fiasco in Norway infuriated the whole country, and in the debate in the Commons of May 6-8 his vote of confidence was passed by only 251 to 200, a great many gov. supporters abstaining. C. then tried to meet the rising storm by reshuffling his Cabinet, but Labour refused to join any gov. under him and he resigned on May 10, the day when the Gers. invaded the Low countries. As lord president of the council in the Churchill Gov. he wholeheartedly supported the new Prime Minister's resolve to continue the war come what might. At the end of July he underwent an operation, but hopes of recovery were not fulfilled. He resigned on Oct. 3, 1940, and d. Oct. 9. See D. Keith Shaw, *Prime Minister Neville Chamberlain*, 1939; K. Feiling, *The Life of Neville Chamberlain*, 1946.

Chamberlain, Lord Great, an hereditary sinecure office, historically descended from the anct. Chamberlain of the Exchequer dept. of the Norman period. The office was formerly of the highest dignity, and was held in grand serjeanty. The L. G. C. is now the sixth great officer

of state, and the duties of the office are mainly concerned with coronation ceremonies. To the office also appertain the care of the king's palace at Westminster, authority over the buildings, of the two Houses of Parliament during recesses, and the duty of attending on peers at their creation, and bishops when they perform their homage. The element of 'serjeanty', or personal service, is preserved by the L. G. C.'s theoretical right to dress the king on coronation day and to serve the king with water before and after the banquet. The office, which became hereditary on the grant by Henry I. to the family of De Vere, earls of Oxford has been the subject of two legal contests within the last 150 years. Towards the end of the nineteenth century it was still held conjointly by the families of Cholmondeley and Willoughby d'Eresby, in right of their mothers, who were sisters and co-heirs of the fourth duke of Ancaster, but later it was in the joint tenure of the marquess of Cholmondeley, the earl of Ancaster, and the marquess of Lincolnshire. On the coronation of Edward VII. the honorary functions of the office were by mutual agreement committed to the care of the marquess of Cholmondeley. The present holder of the office is the earl of Ancaster.

Chamberlain, Basil Hall (1850-1935), Eng. scholar in Jap. language and writing, b. at Southsea, Hampshire. Educated in France and by a private tutor in England. Held the appointment of prof. of Japanese and philology at the univ. of Tokyo. Among his pub. are *The Classical Poetry of the Japanese* (1880); *A Romanised Japanese Reader* (1886); *The Language, Mythology, and Geographical Nomenclature of Japan viewed in the Light of Aino Studies* (1887); *Practical Introduction to the Study of Japanese Writing* (2nd ed.) (1905); *Things Japanese* (5th ed.) (1905); *Handbook of Colloquial Japanese* (1907); *Murray's Japan* (3rd and subsequent eds. in collaboration with W. B. Mason); *Japanese Poetry*, 1910; *Iluit Siècles de poésie française*, 1927.

Chamberlain, Houston Stewart (1855-1927), Anglo-Ger. author, b. at Southsea, Hampshire, son of Rear-Adm. Wm. Charles Chamberlain. Became lecturer on philosophy at the Vienna Univ. The results of his study of modern thought and civilisation are embodied in his remarkable book *Die Grundlagen des neunzehnten Jahrhunderts* (1899), trans. into Eng. in 1910. In 1896 he pub. a most appreciative biography of Wagner, whose daughter he married, and for whom he again showed his admiration in *Das Drama R. Wagners* (1892). Among his other works are *Die ersten 20 Jahre der Bayreuther Bühnenfestspiele* (1896); *H. von Stein und seine Weltanschauung* (1903); *Immanuel Kant* (1905); *Goethe* (1912); *Rasse und Nation* (1918); *Mensch und Gott* (1921). He espoused the cause of Germany in the First World War, and in 1916 was naturalised a Ger., incurring thereby considerable odium in the Brit. press. C. was a strong anti-Semite and

probably Hitler derived his Aryan theory and policy partly from C. as well as from Gobineau, Lapouge, and others. He d. at Bayreuth. See A. Rosenberg, *Houston Stewart Chamberlain als Begründer einer deutschen Zukunft*, 1927.

Chamberlain, Joseph (1836-1914), Brit. statesman, was b. in London. He was the eldest son of Joseph C., a well-to-do business man, who was a Unitarian by religion and a man of advanced political ideas. Joseph C. was educated at Canonbury and at the Univ. College school (London). On leaving school he spent a short time in his father's office in tn., and then left for Birmingham, where he joined his cousin, Joseph Nettlefold, in the screw business. His keen business methods and his undoubted ability ensured the progress of the firm. New methods were introduced into the business, and competition was successfully cut down by means of a series of amalgamations. The result of this keen business ability was that at a very early stage C. was able to retire from business and take an active interest in public life. During his stay in Birmingham he had taken more and more interest in local politics, and when he retired from business in 1874 he was able to devote most of his time to these. He had married in 1861 Harriet Kenrick, who d. in 1863, and later, in 1869, he married again Florence Kenrick, a first cousin of his first wife. He was already recognised as one of the leaders of liberal ideas in Birmingham, and had been instrumental in establishing a Liberal Association in the tn. He also took a prominent part in the educational movements of the time. In 1870 he became a member of the Birmingham school board, and three years later the chairman. His politics at this time were usually given the name of republican, not because they actually advocated the principles of republicanism, but because they were so advanced and so radical that they easily outdistanced even the most liberal ideas of the formal Liberal party. He took a prominent part also in the municipal affairs of Birmingham, and in 1873 he became mayor of Birmingham, an office he occupied for the succeeding three years. Birmingham dates a great deal of her importance back to the days of his mayoralty. Great municipal reforms were carried out during his period of office. A magnificent library and an art gallery were built, public recreation grounds were opened, slums were pulled down, and spacious and well-paved streets took their places. The prosperity of Birmingham rose very rapidly indeed. The rise of C. as a leading reformer in municipal matters had not passed unnoticed throughout the rest of England. Already he was marked as a coming man, the fame of his reforms was spread about, his utterances were taken up by the press, and in addition to his popularity as mayor of Birmingham he was also well known throughout England. In 1874 he contested a parl. seat in Sheffield, but without success. However, two years later, C. became the

colleague of Bright in the representation of Birmingham. Hitherto his work had been confined to Birmingham, now he rapidly advanced towards the front ranks of the Liberal party. Almost simultaneously with his entrance into public politics, his ability and worth were recognised. He showed his organising ability by the manner in which he organised the Liberal Association throughout the country, an organisation for which both he and the Liberal party were recompensed in the general election of 1880, when the Liberals were returned with a clear majority over both the Conservatives and the Nationalists. In the Liberal Gov. of 1880, C. was given the position of the president of the Board of Trade, with Cabinet rank, and Sir Charles Dilke, another leader of the radical section, became under-secretary for foreign affairs. In 1883 he carried his Bankruptcy Act, and throughout the whole of his tenure of office he supported democratic ideas. In 1885 he put forward what was called the 'unauthorised programme,' that is, a programme which went far beyond the conception of the Liberal party. He had up to this time supported the Liberal party on questions of foreign policy, and more especially Irish policy. He advocated also free education and small holdings, the famous phrase 'three acres and a cow' exemplifying the latter policy. In 1885 Gladstone's ministry was defeated. At the elections which followed the number of Liberal members was decreased, and it became necessary to depend on the Irish vote for a majority. C. was returned for W. Birmingham, and in Jan. 1886 Lord Salisbury's Gov. was defeated. Already it was known that Gladstone was going to introduce a Home Rule Bill, but C. accepted office as president of the Local Gov. Board. In March he resigned, giving as his reason that he was unable to accept the measure which Gladstone had laid before the Cabinet, that he still supported a large extension of local gov. for Ireland, but could not go to the lengths proposed. There was, however, not yet any definite break with the party; constant efforts were made to get Gladstone to amend his Bill, but finally, when it became obvious that the measure would come up for its second reading in practically its original form, serious steps were taken by Lord Hartington and C. At a meeting of the followers of Hartington and C. it was agreed that the dissentient Liberals must vote with the Tories against the Bill, and this was done. The Bill was rejected by a majority of thirty, ninety-four Liberal-Unionists, as they now began to be called, voting with the majority. Even yet reconciliation with the Liberals was not impossible. A round-table conference was held, the idea being put forward by C., but it came to nothing; a working basis could not be found, and the split in the party became more definite. The feeling of the Liberals, not unnaturally, was deep and bitter against C., and one member at least did not refrain from calling him Judas. The Liberal-Unionists

rapidly became more and more separated from the Gladstonian Liberals, and they adopted a definite policy for themselves. They decided that it was necessary under every consideration to keep Gladstone out of office, and they supported the Tories with that end in view. They did not, however, yet take office with the Tories, and their influence was rather widening in Tory policy. The Tory Gov. passed measures which up to this time had been regarded solely as part of the Liberal programme, and many of them were more progressive than similar measures previously adopted by the Liberals. In 1887 C. became one of the Brit. plenipotentiaries to the U.S.A. for the purpose of discussing various fishing disputes which had arisen. He returned to England in 1888 and was given the freedom of Birmingham. In the same year he married his third wife (Mary Endicott). In the general election of 1892 he was again returned for his old constituency, but the Liberal-Unionists and Tories were in a minority and Gladstone again became Prime Minister. In 1893 C. took the most prominent part in opposing the Home Rule measure introduced by Gladstone; a measure which passed the House of Commons but was rejected by the Lords. In 1895 the Rosebery Gov. was defeated, and the gov. which was formed by Lord Salisbury included a number of Liberal-Unionists. This was the first great definite step towards the union of the parties. C. became colonial secretary.

The period 1895-1900 was one of great difficulty, especially in the matter of colonial affairs, and more especially in S. Africa. The Jameson Raid did not help the strained feelings which existed between the Brit. Gov. and the Boers, and the whole difficulty was often attributed by his political opponents to C. and his desire for personal aggrandisement. Every step in the negotiations of 1899 was attributed to personal feeling on the part of the colonial secretary. War broke out in 1899, and in 1900 C. received vindication in the result of the election which followed. During this period of office he had also passed the Australian Commonwealth Act (1900). During the years of office C. had advocated the policy called imperialism. He had never subscribed to the narrow limits of the Gladstonian foreign policy, and his tenure of office as minister for the colonies had taken his ideals from the purely national point of view and widened them to the imperial point of view. During the war he was the hero of his party, and by his firm policy and his unswerving support of the war did much to enhance his reputation. In 1902 Arthur Balfour became Prime Minister, and C. continued to serve under him. He visited S. Africa in the same year, and did much to smooth over the bad feeling which still existed. But he had become essentially a colonial minister, and he regarded from the broader point of view all issues. During the war a corn tax had been levied, and had caused some considerable perturbation at the time, but since it was regarded only as a war tax it

had been supported by the party. Ritchie now proposed to take the corn tax off. Sev. of the members of the Unionist party were in favour of its permanent retention. C. advocated the remitting of the tax in the case of the colonies, but its retention as far as foreign corn was concerned. The tax was remitted, but it became obvious that there were serious differences within the party on the question of Free Trade. No open split took place until the following year, when C. put forward the main ideas of tariff reform at Birmingham. He held that it was impossible to inaugurate a system whereby we could help our colonies without a revision of our present tariff system. The movement found support and opposition. Some political economists issued manifestoes in favour of it, more issued manifestoes against it. The party itself was divided, and on Sept. 15, C., pleading for a free hand, resigned. Ritchie and Lord George Hamilton, the stauncher free traders, also resigned at the same time. C. resigned merely to become the pioneer of the movement which he advocated, and not from any sense of hostility towards his 'friend and leader' Balfour. Balfour's attitude on the question was more or less philosophic, and he was claimed by both sections of his party. He, however, made it clear that he was in favour of a measure of tariff reform for purely retaliatory purposes. C. spent the years 1903-6 in travelling throughout the country advocating his system of tariff reform. He was attacked on every side, and his party to all intents and purposes, if not openly, was divided seriously on the question. The withdrawal of C. from the Cabinet, and the advocacy of these new measures, contributed to the downfall of the gov., which resigned in Dec. 1905. The election which followed was to a very great extent the result of the differences in the party. C. insisted on the adoption of his principles, and the Unionist party was overwhelmed at the elections. Balfour after the elections pledged himself to tariff reform, which after that became the prin. plank of the Unionist platform. In the middle of 1908, after he had received an overwhelming ovation from his fellow citizens on his seventieth birthday, C. was taken ill, and although at first it was hoped that he would recover sufficiently to return to Parliament, the hope was in vain. He retained his seat for W. Birmingham, but did not take a prominent part in the deliberations of the party after his illness. Like all strong men C. was the object of intense admiration and dislike, and probably no Eng. politician of his time aroused such strong political passions. He d. at Birmingham, July 2. A memorial museum was opened at Highbury—his home in Birmingham—by Sir Austen Chamberlain in 1934. See J. L. Garvin, *The Life of Joseph Chamberlain*, 1932.

Chamberlain, Sir Joseph Austen (1863-1937). Eng. statesman, eldest son of Joseph C. Educated at Rugby and Cambridge. In 1892 he entered Parliament as Liberal-Unionist member for E

Worcestershire, for which constituency he sat till 1914. From that year he represented Birmingham W.; and has been called 'the last reminiscence of Victorian correctness'—in allusion to his adherence (almost alone) to the old habit of wearing a hat inside the House of Commons. During Lord Salisbury's third administration (1895-1900), C. was civil lord of the Admiralty, being promoted as financial secretary to the Treasury on the formation of Salisbury's fourth Gov. (1900-2). As financial secretary he represented the postmaster-general, Lord Londonderry, in the House of Commons. He became postmaster-general in Balfour's first Gov., July 1902. C. was appointed chancellor of the exchequer on the reconstruction of Balfour's Cabinet, 1903-6. He married in 1906. In 1913 he was chairman of the royal commission on Indian finance and currency. In the Coalition Gov. formed during the First World War he was secretary of state for India 1915-17—resigning because the dept. over which he presided was culpable in regard to the Mesopotamian campaign. He became a member of the War Cabinet, without office, in 1918. He was chancellor of the exchequer 1919-21; Lord Privy Seal and leader of the House of Commons 1921-22. Later, in the Conservative Gov., he was secretary of state for foreign affairs 1924-29; but in the autumn of 1928 he was obliged to take a long sea-voyage for his health. Though he signed the Locarno Treaty Oct. 16, 1925, and the Kellogg Pact Aug. 27, 1928, he was, in the estimation of peace enthusiasts, but a lukewarm supporter of the League of Nations. He made an extremely creditable recantation concerning the vote he had given against the grant of representative gov. to S. Africa. He missed his chance of leadership of his party twice—in 1911 and in 1922. He was lord rector of Glasgow Univ. 1925-28. He received the Nobel Peace prize, 1926. Re-elected at general election by a narrow majority, 1929, and by a larger majority in 1931 and again in 1935. Wrote his autobiography in 1935. See Sir C. Petrie, *The Life and Letters of Sir Austen Chamberlain*, 1939, 1940.

Chamberlain, Sir Neville Bowles (1820-1902), Brit. field marshal, b. at Rio de Janeiro, Brazil. He entered the Indian Army in 1837 and took part in the Afghan war (1839-42) at Ghazni, Kandahar, and Kabul, and was wounded on six occasions. He fought at Maharajpur in the Gwalior campaign of 1843 and in the Punjab campaign of 1848, after which he was made commandant of the Punjab military police. In the Indian Mutiny (1857) he distinguished himself at Delhi, where he was severely wounded. He was in command of the Umberia campaign (1863), and from 1876 to 1881 was commander-in-chief of the Madras Army. He retired in 1888, and was made a field marshal in 1900. See life by G. W. Forrest, 1909.

Chamberlin, Thomas Chrowder (1843-1928), Amer. geologist, b. at Mattoon, Illinois. In 1869 he was appointed prof.

of natural science at the State Normal School of Whitewater, Wisconsin. In 1892 he was appointed prof. and head of the dept. of geology and director of the Walker Museum of the Univ. of Chicago. In 1894 he accompanied the Peary Arctic Relief Expedition as geologist. He was also from 1902 to 1909 investigator of fundamental geological problems in the Carnegie Institution.

His theories on the glacial deposits of the N. states, together with his work on the planetesimal hypothesis with Moulton, won for Prof. C. a world-wide reputation. For nearly forty years he ed. the *Journal of Geology*, and his publications include *The Geology of Wisconsin* (1877-1883); *Contribution to the Theory of Glacial Motion* (1904); *General Treatise on Geology* (with R. D. Salisbury) (1907-9); *The Origin of the Earth* (1916); *The Two Solar Families: the Sun's Children* (1928).

Chamber Music, name for music suitable for performance in small rooms as opposed to church or theatre music, and especially at the present day to concert music. According to the authority Dr. Percy Scholes, the modern conception of C. M. dates only from Haydn and the mid-eighteenth century, for in the preceding century and a half in the harpsichord era such a conception was impossible. Haydn, Mozart, Beethoven, and Schubert are the greatest creators of C. M. up to the end of the first quarter of the nineteenth century. The term was first used in the seventeenth century, when instrumental music, then in its infancy, was limited to dances, *locatas*, etc., in four parts; and at the time it connoted, almost exclusively, vocal music, such as the chamber cantata or chamber duet. When the later forms of instrumental music came into existence—chamber, concerto, symphony, suite, sonata, etc.—these forms and all music that was not essentially church or theatre music became known as C. M. To-day only works performed by a few solo instruments are included in the term: such are trios, quartets, quintets, etc., up to octets and sonatas for strings, or strings and wind, with or without pianoforte, sonatas for pianoforte and one-stringed or one-wind instrument, solo compositions for one instrument, and also songs, duets, and trios for voices, with accompaniment of one or a few instruments. Concert music, orchestral and choral, is now generally understood as being the true opposed term to C. M. C. M. may be properly said to have a chamber style because the lack of fullness of sound and of variety of instrumentation has to be compensated by fine shading and detailed execution; and C. M. composition in which the parts are treated orchestrally is faulty. (See also CANTATA, SONATA, etc.). In France, Saint-Saëns, Gabriel Fauré, and César Franck were pioneers of modern Fr. C. M., and the real creators of the Fr. school of C. M. Debussy's influence is also considerable and the day his string quartet was first played is a landmark in the hist. of Fr. music.

Belgian C. M. is cultivated with a very

special partiality and it is in this domain that the Belgian composers of the early twentieth century have composed their most significant works, notably Joseph Jongen and Victor Vreuls. The chief names in Ger. C. M. are Johannes Brahms, who produced a great number of piano-forte trios, quintets, violin sonatas, and clarinet sonatas; Hans Pfitzner and the Neo-Romanticists of the Munich school; Thullie, Reuss, Kaspar, and others; and musicians who, like Herzogenberg and Arnold Mendelssohn, fill the classical forms of Brahms with more or less romantic subject-matter. Mention should also be made of Mendelssohn (F.) who wrote a string octet, two quintets, seven quartets, etc.; and Robert Schumann who also left much C. M. Max Reger and his disciples are later exponents of the style which makes a departure from Brahms. Among moderns the chief are Schönberg (q.v.), Busoni (q.v.), Schnabel, Bruckner (q.v.), Hindemith (q.v.), and others who, like contemporary composers of C. M. in Russia, England, and France, cultivate abstraction and expressionism. N. Rimsky-Korsakov, C. Franck, K. Goldmark, C. Saint-Saëns, H. Huber, E. Elgar, Ethel Smyth, A. Arensky, C. Koechlin, B. Bartók, D. Tovey, S. Coleridge-Taylor, B. Smetana, A. Dvořák, C. Sinding, F. Jellus, C. Debussy, A. Glazunov, R. Vaughan Williams, M. Ravel, V. Tommasini, I. Stravinsky, A. Berg, A. Hliss, E. Goossens, and W. Walton are among the many, more modern, composers who have written C. M. for string quartets, quintets, or sextets, or sonatas for piano and violin.

Chambers, Charles Haddon (1860-1921), playwright, b. at Stammore, Sydney, New S. Wales, Australia; son of John Ritchie C., a native of Ulster. Educated in New S. Wales. Entered civil service, 1875. Two years later became a stock-rider in the Bush. Visited England and Ireland; returned to and settled in England, 1882, and became journalist, story-writer, and finally dramatic author. His plays include *Captain Swift* (produced 1888); *The Idler* (1891); *The Honourable Herbert and the Old Lady* (1892); *John-a-Dreams* (1894); *The Tyranny of Tears*, his best work (1899); *Passers-By* (1911). Part author of *The Fatal Card*, *Boys Together*, and *The Days of the Duke*.

Chambers (or Chalmers), David, Lord Ormond (c. 1530-92), Scottish judge and historian, educated at Aberdeen, then studied theology and law in France and Italy. Parson of Suddy, chancellor of Ross, lord of session (1565). A partisan of Mary Queen of Scots, said to have been privy to Darnley's murder, 1567. Attainted by Parliament after the battle of Langside, he fled to Spain and France. Pub. *Abregé des Histories*, reprinted with additions, 1579 (a chronological summary of European hist.). C. returned to Scotland, becoming again lord of session, 1586. See G. Mackenzie, *Lives of the most eminent writers of the Scots Nation*, iii., 1708-22; F. Michel, *Les Écossais en France, Les Français en Écosse*, ii., 1562.

Chambers, Sir Edmund Kirchover, distinguished Eng. Shakespearean scholar, b. in Berkshire March 16, 1866, son of Rev. Wm. C., Fellow of Worcester College, Oxford. Educated at Oxford Univ. His great works are *The Medieval Stage* (1903), and *The Elizabethan Stage* (1923). In these he shows the connection between the political and social hist. of England and the growth and flowering of the drama. The latter book unfolds in minute detail the story of each stage company, and sums up all the knowledge in existence on the subject. Other publications include *Tudor Revels* (1906); *Shakespeare: A Survey* (1925); *William Shakespeare* (1930); *Arthur of Britain* (1928), a brief but penetrating discussion of Nennius's sources; *Oxford Book of Sixteenth Century Verse* (1932); *S. T. Coleridge* (1938); *A Sheaf of Studies* (1942).

Chambers, Ephraim (1680-1740), Eng. encyclopedist, b. at Kendal. As a young man he was apprenticed to a map- and globe-maker in London. In 1728 he pub. by subscription his *Cyclopaedia, or an Universal Dictionary of Arts and Sciences* in competition with Harris's *Lexicon Technicum*, 1704. C.'s work reached its fourth ed. a year after his death, and gave rise to the *Encyclopédie* of Diderot and d'Alembert.

Chambers, George (c. 1803-40), marine painter, b. at Whitby, Yorkshire. He was the son of a fisherman, and in early life was apprenticed to the master of a trading brig. He soon showed a talent for painting, and his little sketches of shipping scenes found a market in Whitby. His ambition, however, drew him to London, where he received employment as a scene-painter at the Pavilion Theatre. He also worked on the panorama of London at the Colosseum. His work received the attention of Lord Mark Kerr, through whose kindness C. received the appointment of marine painter to William IV. and Queen Adelaide. He was a member of the Society of Painters in Water Colours, and exhibited from 1827 to 1840. Two of his pictures of naval battles are in Greenwich Hospital, viz. 'The Capture of Portobello,' and 'The Bombardment of Algiers in 1836.'

Chambers, Robert (1802-71), Scottish publisher and author, b. at Peebles and educated at the local school. In 1818 he started business as a bookstall keeper in Leith Walk, Edinburgh. Eventually he joined his brother Wm. (q.v.), who started a similar business, and the two founded the publishing firm of W. & R. Chambers. In 1825 he pub. *Traditions of Edinburgh*, which won him the friendship of Scott and led to further writings of the same description, *Notes of the Most Remarkable Fires in Edinburgh from 1386 to 1824* (1824); and *Walks in Edinburgh* (1825). Robert was at first only a contributor to the *Journal* started by his brother in 1832. Later he became joint editor, and his essays and wisdom in selection of such materials in literature, hist., art, and science as would best suit the popular taste were large factors in the success of the paper. He wrote or

contributed to *A Biographical Dictionary of Eminent Scotsmen* (1832-35); the *Cyclopædia of English Literature* (1844); containing selected extracts from the best authors in each period 'set in a biographical and critical history of the literature itself'; the *Life and Works of Robert Burns* (1851), for which he gathered many hitherto unpublished details from the poet's sister, Mrs. Begg; *Ancient Sea-Margins* (1848); *Domestic Annals of Scotland from the Reformation to the Revolution* (1859-61). He also contributed 'Histories of the Scottish Rebellions' to Constable's *Miscellany*, 1828-29. Robert C. was an ardent scientist, and visited Scandinavia and Canada for purposes of geological exploration, the results of which are contained in *Tracings of the North of Europe* (1850), and *Tracings in Iceland and the Farøe Islands* (1856). In 1844 he pub. anonymously, to avoid bringing an accusation of heterodoxy upon his firm *Vestiges of the Natural History of Creation*, which anticipated the theories of Darwin's *Origin of Species*. The authorship was acknowledged in Alexander Ireland's preface to the twelfth ed. (1884). In 1869 the univ. of St. Andrews conferred upon him the degree of Doctor of Laws, and he was elected a member of the Athenæum Club in London. His labours in compiling his last publication, *The Book of Days* (1862-64), ruined his health and probably hastened his death. Besides the works already mentioned Robert C. wrote *The Popular Rhymes of Scotland* (1826, 1842), a valuable addition to Scottish folklore; *Scottish Ballads and Songs* (1829); *Romantic Scotch Ballads with original Airs* (1844); *Songs of Scotland prior to Burns* (1862); and *Life of Sir Walter Scott* (1835). See W. Chambers, *Memoir of Robert Chambers with Autobiographic Reminiscences of William Chambers*, 1872, 1884, and *Story of a Long and Busy Life*, 1884; J. Payn, *Some Literary Recollections*, 1884.

Chambers, Sir William (1726-96), Eng. architect, b. at Stockholm. As a boy he went to sea, but in 1744 began to study architecture in Italy and Paris. He remodelled Somerset House (1776), designed the pagoda and other buildings in Kew Gardens (1762), and was first treasurer of the Royal Academy (1768). His *Treatise on Civil Architecture* (1759) is a standard text-book. His absurdly extravagant *Dissertation on Oriental Gardening* (1772) called forth the satire *An Heroic Epistle to Sir William Chambers*, in which Wm. Mason and Horace Walpole took part. Life by T. Hardwick, 1825.

Chambers, William (1800-83), Scottish publisher, b. at Peebles. In 1813, owing to family misfortunes, he was apprenticed to a bookseller in Edinburgh. Five years later he started business for himself, afterwards adding printing to the bookselling, and was soon joined by his brother Robert. In 1825-30 he wrote the *Book of Scotland*, and collaborated with Robert in a *Gazetteer of Scotland*. His fortnightly jour. called *The Kaleidoscope* ran only

from Oct. 6 (1821) to Jan. 13 (1822). In 1832 he issued the first number of *Chambers's Edinburgh Journal*, the pioneer of the cheap popular periodical. After the issue of the fourteenth number Robert became co-editor, and the prosperity of the jour. rapidly increased. This led to the founding of the firm of W. & R. Chambers, and the issue of a series of works designed for popular instruction which met with immediate popularity. *Chambers's Information for the People* was pub. in 1833; in 1835 appeared the *Educational Course*, including the *Cyclopædia of English Literature* (2 vols.); *Miscellany of Useful and Entertaining Tracts* (20 vols.); *Papers for the People* (12 vols.), and *Chambers's Encyclopædia* (10 vols.), first pub. in 1859-68. In 1849 Wm. bought the estate of Glenormiston, Peeblesshire, and in 1859 endowed the Peebles Institution, which includes a library, museum, and art gallery. He was twice lord provost of Edinburgh, during which he promoted sev. improvements in the city and restored, at his own cost, the cathedral of St. Giles. He was offered a baronetcy, but d. before the title could be conferred. Besides his contributions to the *Journal* and the *Educational Course*, Wm. C. wrote: *Tour in Holland and the Rhine Countries* (1839); *Things as they are in America* (1854); *History of Peeblesshire* (1864); *France: its History and Revolutions* (1871); *Aitie Gibroy* (1872); *Stories of Old Families and Remarkable Persons* (1878); and *Historical Sketch of St. Giles's Cathedral* (1879). See also CHAMBERS, ROBERT.

Chambersburg, tn., cap. of Franklin co., Pennsylvania, U.S.A., 50 m. S.W. of Harrisburg. The tn. has many fine buildings, among which is the Willson College for girls. The trade of the tn. is extensive, and among its chief manufacturing industries are leather, cotton, and woollen goods, iron utensils, paper, and furniture; it has also large locomotive works. In 1864 a portion of the tn. was destroyed by the Confederates. Pop. 14,800.

Chambertin, rare red Burgundy produced from the vineyard of Chambertin in the dept. of Côte-d'Or, France, about 6 m. S. of Dijon.

Chambéry, cap. of the dept. of Savoie, France, situated, amid beautiful scenery, in a valley 6 m. S. of Lake Bourget. The tn. contains some interesting old churches and a fifteenth-century cathedral. The castle of the dukes of Savoy was destroyed by fire, but was restored at the beginning of the last century and is now used for administrative purposes. The industries include the manuf. of silks, lace, clocks, and soap. Pop. 25,400.

Chambon-Feugerolles, Le, steel-manufacturing tn. in the dept. of Loire, France, situated in the vicinity of St. Etienne. Pop. 15,000.

Chambord, famous château of the Renaissance period, situated in the dept. of Loir-et-Cher, France, 12 m. E. of Blois. The building of the castle was commenced by Francis I. in 1526, and was completed by his successors of the Houses of Valois

and Bourbon. It is a huge pile, capped by many turrets and gables, and stands in a walled park of 13,000 ac. It has been the residence of the Fr. kings down to Louis XV., and of Marshal Saxe, Diane de Poitiers, Stanislaus Leszczyński, king of Poland, and Marshal Berthier, who had it conferred upon him by Napoleon in 1809. After the death of Berthier it passed into the hands of the comte de Chambord, who left it to the house of Bourbon-Parma. Molière gave his first performance of the *Bourgeois Gentilhomme* in the castle in 1670. See A. Arnaud, *La Question de Chambord*, 1887; and H. Debraye, *Touraine and its Châteaux*, 1926.

Chambord, Henri Charles Dieudonné, Comte de and Duc de Bordeaux (1920-83), posthumous son of the duc de Berry and grandson of Charles X. of France, was b. in Paris. Charles X. abdicated in favour of his grandson in July 1830, but the machinations of the people to put Louis Philippe on the throne caused Charles and his grandson to flee to England for safety. C. subsequently went to Gorz, where he came under the influence of the duc de Damas, and became imbued with uncompromising ideas on predestination and the divine right of kings. His movements and plans were marked with great indecision, and his readiness to comply with the plans of the vacillating nobles who espoused his cause dissipated his chances of attaining to the throne. It was thus in 1848 his claim was lost, and again in 1870 at the close of the Franco-Ger. war. At the fall of Thiers in 1873 his cause was finally ruined. He d. at Frohsdorf, Austria, without an heir, the nearest claimant being the comte de Paris.

Chambre Ardente (Fr. flaming chamber), court organised in 1535 by Francis I. of France for the suppression of Protestant heresy, and the examination of cases of poisoning. The courts were draped with black and lit, even in the day-time, by torches. The most famous was that which was summoned to try the Brinvilliers poison case of the reign of Louis XIV.

Chambre Introuvable (Fr. for 'the matchless chamber'), name popularly given to the unprecedented Chamber of Deputies which was first convened in July 1815, after the second recall of Louis XVIII. It was bestowed by the king out of gratitude, although some say in irony; for this Parliament roused indignation and alarm throughout France for its thoroughgoing royalist policy. The term has since been ironically applied to any ultra-monarchical assembly.

Chamdo, or **Chiamdo**, tu. in Tibet, situated on the Lantsang; it has sev. monasteries, and is much frequented by Lamaist pilgrims.

Chamaleon, name of a large and distinct order of lizards in the family Chamaeleonidae which inhabit Asia and Africa, but especially Madagascar. Many of their characteristics are very peculiar, e.g. the long, prehensile tail used in steadying the animal by being coiled round a branch; the long sticky, club-shaped tongue which

can project about the length of its body; the eyes covered with a thick granular lid capable of moving independently and squinting; the five digits in bundles of twos and threes; the triangular head, flattened body with a toothed crest; and the habit of changing colour which can be performed at will. They are all insectivorous, are rather quarrelsome and inactive, difficult to keep in captivity, and when angry they will distend their capacious lungs and puff out their bodies to a great extent. At night they sleep on a twig, and in winter hibernate after taking in large supplies of food and water.



CHAMELEON

Nearly all are oviparous, and the female lays her thirty to forty eggs in a hole in the ground. The commonest species is *Chamaeleon vulgaris*, which never exceeds 1 ft. in length, and *Ch. parsoni* is the largest species, sometimes measuring 2 ft. from head to tail.

Chamfer, term in masonry and carpentry signifying to groove, bevel, or furrow.

Chamfort, Nicolas Sebastian Roch (de) (1741-94), noted Fr. cynic and author, b. at Clermont in Auvergne, France. His writings and brilliant conversation attracted a wide circle of admirers of every class. Louis XVI. and Marie Antoinette favoured his literary efforts, but he was keenly opposed to the Royalist party during the revolutionary agitation. He, however, defeated his own purpose by directing his cynicism against his own party. His irate associates conspired against him, and to escape he was obliged to commit suicide. His works, mainly of apophthegms and anecdotal, were ed. by Auguis and pub. in five vols., 1824-25. A selection of his works, called *The Cynic's Brerary*, is trans. by Hutchinson.

Chamidae, family of molluscs nearly related to the cockles, belongs to the order Eulamellibranchiata. The members of the family are confined to the warmer seas, and fossils are abundant from the Jurassic.

Two of the chief genera are *Chama* and *Diceras*.

Chamier, Frederick (1796-1870), naval historian and novelist, entered the navy at the age of thirteen, and served in the Walcheren expedition, and on the Mediterranean and W. Indian stations. He devoted his leisure to authorship. His most valuable work was a continuation of W. James's *Naval History of Great Britain* (1837).

Chaminade, Cecile, Louise Stephanie (1861-1944), Fr. musical composer, b. at Paris. She began to compose at the age of eight, and her works became well known in France and England, where she toured widely. Works: *Les Amazones* (dramatic symphony); *Callirhoe* (symphonic ballet); *Trios*, for piano, violin, and cello; sev. vols. of melodies and numerous piano pieces.

Chamisso, Adalbert von (Louis Charles Adelaide de Chamisso de Boncourt) (1781-1838), celebrated Ger. poet and naturalist. He was b. at the château of Boncourt in Champagne, but spent his childhood in Prussia, where his family took refuge during the Fr. Revolution. In 1798 he entered the Prussian Army, but in 1806 when war broke out, his patriotism led him to return to his native country. In Paris he became the friend of Mme de Staël at Coppet, where he met Schlegel. At this time he began the study of botany, which he afterwards continued at Berlin, being appointed curator of the botanic gardens in 1819. He ed. the *Musenalmannach* (1804-6), and became a member of the Berlin Academy in 1835. C.'s fame rests on his romantic ballads, which are by turns fantastic and lurid. *Peter Schlemihls wundersame Geschichte* (1814), a prose tale, already known to folklore, of the man who sold his shadow to the devil, has been trans. into almost every European tongue. C. made many verse translations from poems in other languages, the most notable being the *Song of Thyrm*. He wrote also sev. works on natural hist. His collected works were pub. at Leipzig in 1864, with a biography by E. Hitzig and his letters of 1836-39. See K. Fuld, *Chamisso und seine Zeit*, 1881; E. du Bois-Reymond, *Chamisso als Naturforscher*, 1889; and K. Leutner, *Chamisso: a Sketch of his Life and Works*, 1893.

Chamois, goat-like antelope (*Rupicapra tragus*) inhabiting the mts. of Central and S. Europe (especially the Alps) and of W. Asia. Noted for great speed, agility, and delicate power of scent. The flesh is highly prized as venison, the skin furnishes true chamois-leather (sheepskin is often sold as such). The hunting of C. is a favourite but dangerous pastime in Switzerland and the Tyrol. In the Caucasus, Taurus, and Carpathians over 100 are often seen in a flock. The C. has short horns, and is grey-brown in colour.

Chamonix-Mont-Blanc, Chamounix, Chamouni, beautifully situated vil. on the Arve in the dept. of Haute-Savoie, France. The vil. is about 40 m. distant from Geneva. It is situated in a narrow ravine to the N. of the Mont Blanc range.

Seven glaciers are in its near vicinity. C. is the best approach to Mont Blanc, and is therefore thronged with tourists. The air at this spot is very bracing, and at all seasons valetudinarians here seek health and strength. De Saussure, who had the honour in 1786 of first ascending Mont Blanc, made his ascent from this point, and a statue of him in the vil. memorialises the event. The altitude of the vil. is 3425 ft., and the pop. 4400. See E. Whymper, *Chamonix and the Range of Mont Blanc*, 1896.

Champac, or *Michelia Champaca*, is an Asiatic species of Magnoliaceæ which is cultivated in China for its beautiful and scented flowers, handsome appearance, medicinal bark, and useful timber. It is a sacred tree of the Buddhists and Brahmans.

Champagne (Fr., flat country, from Lat. *campus*, a field), dist. and former prov. of France, comprising the depts. of Marne, Haute-Marne, Aube, and Ardennes, and part of Seine-et-Marne, Aisne, and Yonne. The prov. was about 180 m. long by 150 m. broad. The land is fertile in the W. region, and its vineyards produce the famous champagne wine. The prov. was ruled at one time by the Franks, and later by native princes, the vassals of the Fr. kings. In 1284 it passed to the Fr. crown by the marriage of Philip IV. with Jeanne de Navarre.

Champagne, Campaign in (First World War). The geographical position of C. renders it an obvious battlefield for an attack on France from the E. or N.E. During the First World War it was the scene of great endeavours by both sides throughout the whole campaign. Towards the end of Aug. 1914, von Moltke, chief of the Ger. General Staff, ordered Prince Rupprecht to penetrate the Fr. frontier at Nancy. The Fr. here were under the command of de Castelnau, and after a battle lasting six days the Gers. were repulsed with heavy loss. This was the first battle in C. Further N., however, the Gers. overran C. in their great sweep towards Paris, and Rheims, Châlons-sur-Marne, Epervay, and Château-Thierry all fell to them early in Sept. 1914. By Sept. 9 the Brit. Army under Sir John French was recrossing the R. Marne at Château-Thierry and taking the offensive against von Kluck, and with this movement the battle of the Marne commenced. By Oct. 14 the Gers. had been forced back from just N. of Verdun—N. of Rheims—and N. of Soissons, and that part of C. S. of that line was not again invaded by the enemy during the war, except on the left, where it was again pierced by the Gers. in July 1918. From the middle of Oct. to middle of Nov. 1914 the Gers. kept a heavy pressure on the Fr. in the Rheims-Soissons sector, and gained some ground about Moussy. At the beginning of the new year another action took place which resulted in the Gers. gaining ground at Crouy. Taking advantage of the disorganisation of the Fr. supplies occasioned by the sweeping away of all the bridges at Villeneuve and Soissons, the Gers.

again attacked, and maintained pressure for two days, and in the end the Fr. were forced to withdraw to the S. of the Aisne at Soissons. A few days later the Fr. lost more positions on the Chemin-des-Dames (q.v.). After this a period of trench warfare set in, the lines occupied being chiefly dictated by the Ger. desire to maintain a strong line on the Verdun-Rheims sector. For strategical reasons (viz. to prevent further Ger. divs. being sent to the E. front against the Russians) Marshal Joffre decided upon a Fr. offensive in C., with a view to clearing the enemy N. of the Aisne. The advance commenced on Feb. 16, and after nearly a month's hard fighting little progress had been made, and at great sacrifice. Still the Fr. maintained pressure against the Gers. in this sector for the first three weeks of March 1915, gaining a little ground here and there. Except for one or two actions, operations were practically suspended for the summer. With the object of breaking through the Ger. line E. of Rheims, an offensive was planned for the autumn. If this were successful it was hoped that it would so threaten the hostile flanks in this region as to compel their withdrawal. No attempt was made to keep the Fr. plan secret, and the Gers. fully prepared to meet the offensive. The preliminary bombardment opened on Sept. 22, and was maintained for three days continuously. Operations went on fiercely until Sept. 29, but again little impression was made on the Ger. positions. Matters remained thus until 1917. The economic situation in France soon produced a general state of mind favourable to offensive action, and Marshal Joffre made plans accordingly. Attacks were to take place in sev. sectors, and on the C. front another effort was to be made about Rheims. Joffre resigned the post of commander-in-chief in Nov. 1916 and was succeeded by Gen. Nivelle, who had to meet difficulties both within and without the army. A change of gov. had brought in ministers unfavourable to the proposed offensive, and these consulted army commanders on the subject behind Nivelle's back. There was much coming and going between parties, but in the end, chiefly owing to support by the Brit. higher command, Nivelle was given a free hand. The offensive in C. commenced on April 16, and, although the Ger. resistance was stubborn, important gains were made in ground and prisoners, etc. The ministers again became hostile to Nivelle, which made things difficult for him. Eventually he was relieved, and Gen. Pétain succeeded him, with Foch as chief of the general staff. One of the chief successes which fell to the Fr. in this region during 1917 was their victory over the Gers. on the Chemin-des-Dames. During Oct. they had taken Fort Malmaison, and this placed them in a favourable position for attacking the Chemin-des-Dames, of which they made full use, the Gers. being compelled to evacuate the position early in Nov. The area to the E. of Rheims was the main scene of the Ger. offensive in May 1918.

Here they succeeded in making a great bulge in the Fr. line towards Paris, with Rheims and Soissons at the E. and W. ends, respectively, of the curve. The Chemin-des-Dames fell to the invader very early, and the Aisne was soon crossed, as was also the Vesle further S. Gradually Fr. resistance about Soissons was felt, then the Amers. brought the Gers. to a halt at Château-Thierry, and within a few days the Ger. offensive had shot its bolt. A further Ger. attack was attempted in the middle of July, but this melted away within two days. It was now the turn of the Allies to take the offensive, and the large salient created by the Gers. in May was an obvious point of attack.

In this area Gen. Mangin was in command of the Fr. Army, to whom great credit is due for the conception and execution of the plan for driving the Gers. out of this region. After a series of minor operations the general offensive commenced on July 18. An enormous number of tanks participated in the assault, and contributed largely to its success. In Aug. the offensive was resumed and maintained until the Gers. were gradually forced back out of C. and eventually out of France.

Champagne, or Champaigne, Philippe de (1602-74), Flemish portrait painter, b. in Brussels. He first studied under Fouquieres at Antwerp, but in 1621 went to Paris, where he became the queen's painter. In this capacity he painted decorations in the Luxembourg for Maria de' Medici. He was appointed rector of the Académie de Peinture et de Sculpture, and received frequent commissions from Cardinal Richelieu. In his later years he became associated with the Port Royalists and the Jansenists. His best-known pictures are 'The Last Supper,' 'The Dead Christ,' and a portrait of Cardinal Richelieu in the Louvre, and a triple portrait of Cardinal Richelieu in the National Gallery.

Champagne Wines are produced in the old prov. of Champagne (q.v.). The Champagne vine country, which was delimited by a Fr. law in 1911, produces 80 per cent of blue grapes (N. of the R. Marne) and 20 per cent of white grapes (S. of the riv.). Sparkling wines made outside this delimited area are not entitled to the appellation C. and are called *vins mousseux*. The produce of the vineyards on the banks of the Marne is the choicest in flavour. In colour C. W. are white, pale amber, pink, or red, and in character are still, creamy, and sparkling (or *non-mousseux, crémant, and mousseux*), of which the last is the choicest. The C. W. are sent all over the world, but especially to Great Britain and the dominions, to N. and S. America, and to the countries of W. Europe. The red wines are mainly consumed in Belgium. The vine in the Champagne country is grown on chalk, and is most carefully cultivated. C., like other light wines (e.g. Moselles, Hooks, and Burgundies), is produced by bottling before complete fermentation. The secondary fermentation taking place in a closed

container (the bottle) the carbon dioxide cannot escape, is dissolved into the wine, and so develops the effervescence. The grapes are carried from the vineyards to the press in baskets shielded from the sun's rays. They are disturbed as little as possible while being placed on the press. The must is kept in vats for half a day to allow the dregs to settle. When fermentation sets in the rich amber-coloured liquid is placed in hogheads of about forty-four gallons in capacity. At Rheims the tuns hold 12,000 litres.



J. Pommery & G^o G^o

A STORAGE GALLERY IN CHAMPAGNE
CAVES AT RHEIMS

The process of bottling takes place from April to June after the various growths have been carefully blended according to their affinities. A good C. should combine flavour, delicacy, elegance, body, and vinosity, and as the product of one vineyard never possesses all these qualities, blending is a necessity. The bottles are filled and the corks are secured by means of an iron adjustment called an *agrafe*. This appliance clasps the neck of the bottle at the rim, and can be adjusted and readjusted at will. The bottles are then laid out horizontally, and fermentation goes on briskly for about three weeks. During this process there is considerable loss owing to the bursting of bottles. About four years after the bottling, the sediment of dead yeast developed by the second fermentation has to be removed by a careful treatment called disgorging. The bottles are fixed neck downwards on

a rack, and as the position is slightly altered day by day the sediment gradually collects on the cork. Then the bottles are immersed in the *dégorgoir* into a brine at 13° F. below zero, the neck of the bottles only bathing in the refrigerating liquid, and after a quarter of an hour there is a small lump of frozen wine formed in the neck of the bottles securing the sediment on the corks. The clamp is then removed, and as the cork shoots out under the pressure of the carbon dioxide, so does the ice and sediment. Very little wine is lost in the process of disgorgement. The space thus left is filled up either with C. of the same vintage if the quality of *brut* is desired, or with an addition of liqueur (which consists of cane sugar dissolved in a good C. wine) in more or less quantity according to the quality to be obtained: 2 per cent for the Extra-Sec, 4 per cent for the Sec, 8 per cent for the Demi-Sec. The Russians prefer a powerful and sweet wine, the Eng. a dry and lively wine, while the Fr. select a light, sweet wine. Inferior quality is most easily detected in the dry species. The bottles are stored for a long time, as the wine mellow with age. C. wine is at its best from eight to twelve years. After twenty years it can quickly deteriorate. The best C. to be drunk in 1949 was 1930, but it would not gain then by being kept any longer. The ordinary qualities are stored for about five years.

Champagnole, Fr. tn. situated in the dept. of Jura. It stands on the R. Ain, a trib. of the Rhône. Pop. 4500.

Champaign, prosperous industrial city in C. co., Illinois, U.S.A. It has many fine buildings, the most notable of which is Illinois Univ. Pop. 22,000.

Champaran, dist. of Bengal, India, situated in the Patna div. of N.W. Behar. Its area is 3531 sq. m., and its pop. 1,941,000.

Champ de Mars, large open space in Paris over half a mile long, and from 200 to 500 yds. wide, stretching from the Eiffel Tower to the Ecole Militaire. Since 1914 laid out as a park with avenues and flower-beds in the Fr. style. Once it was the scene of military reviews, and of the international exhibitions of 1867, 1878, 1889, 1900, and 1925. It possesses an historical interest by reason of the many scenes it has witnessed. During the revolution it was the field of the fête held on the first anniversary of the fall of the Bastille, when a vast assembly acclaimed the federation and vowed eternal devotion to their country. It was laid out as a parade-ground in 1770. In 1791 a regrettable massacre occurred, and in 1804 Napoleon distributed the imperial standards in the square.

Champel-sur-Arve, suburb of Geneva, and fashionable health resort. It has a fine hydropathic and sev. large hotels.

Champerico, important harbour of Central America, situated on the Pacific coast of Guatemala. C. is also the terminus of the San Felipe railway. Pop. 2000.

Champerty, or Champarty (Lat. *campum*

partiri, to divide the land), in criminal law is a species of maintenance or officious intermeddling in a law suit which in no way concerns one. The crime consists in making a bargain with a plaintiff or defendant that, in consideration of the champertor carrying on the action at his own expense, the land or other subject matter of the action shall in the event of success be divided between them. C. is a misdemeanour punishable by fine or imprisonment, or both. It has been held to be a champertous agreement to offer to exercise influence in procuring evidence to support a claim for money upon condition of receiving a portion of the sum recovered. See also MAINTENANCE.

Champfleury, Jules Husson (1821-89), Fr. author, *b.* at Laon. His true name was Jules Fleury-Husson or Husson. He joined the Bohemian circle of Baudelaire and Henri Murger, and was an acknowledged leader of the realistic school. His *Bibliographie céramique* (1882), written after he was appointed director of the Sèvres potteries in 1872, is of some value. Among his novels are *Chien-Caillou* (1847), which won the praise of Victor Hugo; *Les Souffrances du professeur Delleil* (1853) (trans. into Eng. under the title of *Naughty Boys, or the Sufferings of Mr. Delleil*); *Les Bourgeois de Molinchart* (1855), a satirical tale of prov. life among the middle classes; *Les Amoureux de Sainte Perine* (1859); *Le Violon de Faïence* (1862), generally considered his masterpiece; *Monsieur Tringle* (1866); and *Fanny Minoret* (1882). His biographical works include *Honoré de Balzac* (1852). His *Les Chats* (1868) has been trans. into Eng. under the title *The Cat, Past and Present* (1885).

Champligny-sur-Marne, tn. in France, dept. Seine, and 6 m. E.S.E. of Paris. It has manufs. of piano keys and embroideries. There is an early Renaissance chapel, and C. was the scene of two battles during the siege of Paris, 1870. Pop. 27,500.

Champion (Late Lat. *campio*, from *campus*, a field or open space) in the judicial combats of the Middle Ages the hired combatant who took the place of women, children, aged persons, or any incapable of fighting their own battles. These Cs. were of the lowest class, and were regarded as disreputable persons. Later, in the age of chivalry, the name acquired a higher meaning and was applied to a knight who challenged or defended on behalf of an injured lady or child. The office of crown C. is peculiar to England. The 'King's C. in full armour and mounted on horseback rode into Westminster Hall at the coronation banquet and challenged to single combat any who should deny the sovereign's right to reign.' The challenge was never accepted, but the picturesque ceremonial was performed up to the coronation of George IV. The office is hereditary and is held by the family of Dymoke.

Championnet, Jean Antoine Étienne (1762-1800), Fr. general, *b.* at Valence in Drôme. He enlisted in the army at a very early age and took part in the siege

of Gibraltar. When the revolution broke out he took a prominent part; suppressed the Girondist movement in the Jura (1793) without bloodshed; was brigadier-commander in the Rhine campaign and by his stubborn resistance at Fleurus (1794) greatly contributed to Jourdan's victory. In 1798 he was appointed commander-in-chief of 'the army of Rome,' defended Rome against the Neapolitans and the Brit. fleet, and finally captured Naples (1798), setting up the Parthenopean republic there. His intolerance of opposition was the cause of his recall from Italy in disgrace. In the following year he was appointed commander-in-chief of the 'army of the Alps,' but was defeated at Gendia (1799) by the Austrian and Russian troops, and retired to Nice. He *d.* at Antibes in the following year.

Champlain, lake in the N.E. of the U.S.A., lying between Vermont and New York. It is long and narrow, its N. end stretching for nearly 6 m. into Canada. It is drained to the N. by the Richelieu into the St. Lawrence, and is connected by a canal with the Hudson. It has an elevation of about 95 ft. above the sea, and an area of about 750 sq. m., being approximately 110 m. long by from 1 to 15 m. broad. To the E. lies the Green Mt. range to the W. the Adirondacks. The lake was discovered in 1609 by Samuel de C., who gave it his name. It was the scene of many skirmishes during the Fr. and Indian wars, and during the Amer. Revolution. In 1814 the Brit. fleet was defeated by the Amers. in the naval war of 1812-15.

Champlain, Samuel de (1567-1635), Fr. explorer, founder of Quebec and first governor of Fr. Canada, *b.* at Brouage (Saintonge). His youth was spent in the army of Henry IV., and in an expedition to the W. Indies of which he wrote an account in *Bref Discours des Choses plus remarquables que S. Champlain a recogues aux Indes Occidentales* (first pub., 1870). In 1603 he made his first voyage to Canada. On his third voyage (1608) he founded Quebec, estab. friendly relations with the Indians, and founded a prosperous fur trade. In 1612 he was made lieutenant of Canada. In 1629 Quebec fell into the hands of the Eng., and C. was taken to England as a prisoner. At the treaty of St. Germain (1632), which restored Canada to France, C. returned to Quebec as governor. When C. came to the St. Lawrence furs were already being brought to the riv. from great distances, and C. found himself involved in the intense rivalry for the trade. In his trade and explorations C. had followed a policy of making alliances with Indian tribes, especially with tribes N. of the riv. where lay the best fur country. In 1609, soon after Quebec was founded, C. was already beginning to ally himself with the N. Indians. In that year he made an exploration up the Richelieu R. and into the lake which still bears his name. C. was often hindered in making explorations himself by the cares of the settlement at Quebec; but he sent younger men to live with the Indians and learn their ways and

languages. It was through one of these young men, Vignau, that C. was led to make his second important expedition, a voyage, in 1613, up the Ottawa as far as Allumette Lake. Two years later C. undertook his greatest exploration. This was to the Huron country with Etienne Brulé, a Quebec youth, in an attack on the Iroquois. C. made the long trip up the Ottawa, across the Mattawa R. to Lake Nipissing and down the Fr. R. to Georgian Bay and thence to a Huron vill. near Lake Simcoe—in the fighting there C. was wounded and his party retired defeated; and in the following year, C. went home. Brulé carried on the work of exploration subsequently. At C.'s death large parts of the great lakes were still unexplored; but C. was the pioneer in the remarkable voyages which first put the great lakes on the map. His men had pointed the way to the Mississippi and found the St. Mary's R. and Mackinaw Strait, which were subsequently to be the cross-roads of the great fur-trading routes of the N. and W. Great as he was as an explorer, C.'s fame rests solidly on his writings. To-day these are printed, with an Eng. trans., in six large vols. and by a society which bears his name. They are no doubt his best memorials, a valuable and convincing record of the beginnings of Fr. settlement and exploration, besides being an attractive character-study of the man himself. See *Œuvres de Champlain* (6 vols.), 1870, and *Voyages* (3 vols.), 1878-82; also life by Dionne, 1891; and in *Makers of Canada Series, Champlain*, by Dionne, 1905.

Champlain Epoch or Period, name given by Prof. Dana to the period succeeding the Glacial in N. Amer. geology, equivalent to the post-Glacial period of Brit. geologists. The chief traces left by the C. E. are the deposits, including marine shells, round Lake Champlain and elsewhere in N. America, the raised beaches around the great lakes, and old lake basins, now dried up, in their neighbourhood and near the E. coast. The small bitter lakes, the most important of which is the Great Salt Lake of Utah, are the remains of a great system in the W.

Champollion, Jean François, le Jeune (1790-1832), Fr. Egyptologist, b. at Figeac, in the dept. of Lot, France. He was a great student of Coptic, and, indeed of all Oriental languages. In 1816 he was appointed to the professorship of hist. at the Lyceum of Grenoble, which he was afterwards obliged to vacate on account of his Bonapartist sympathies. By comparing anc. MSS. and monuments, C. was led to believe that the three systems of Egyptian writing were identical and inferred that the hieroglyphics represented ideas or letters. By degrees he discovered the twenty-five letters. He was sent on scientific expeditions to Italy, 1824-26, and to Egypt, 1828-30; appointed conservator of the Egyptian collections, 1826; member of the Académie des Inscriptions, 1830; and prof. of Egyptology in the Collège de France, 1830. His works include *L'Égypte sous*

les Pharaons (1811-14), *Sur l'écriture hiéroglyphique des anciens Égyptiens* (1821), *Lettre à M. Dacier* (1822), *Précis du système hiéroglyphique* (1824), *Pantheon égyptien* (1823); and, posthumously, *Grammaire égyptienne* (1836-41), *Monuments de l'Égypte et de la Nubie* (1844), etc. See H. Harlehen, *Champollion, sein Leben und sein Werk*, 1905.

Champollion-Figeac, Aimé Louis (1812-1894), Fr. author, b. at Grenoble, and son of Jacques Joseph C.-F. He was assistant librarian to his father at the Royal Library; also pub. sev. works on Fr. hist., art, and palaeography, and ed. a number of memoirs.

Champollion-Figeac, Jacques Joseph (1778-1867), Fr. archaeologist, elder brother of the more famous Jean François Champollion, b. at Figeac. He became prof. of Gk. at Grenoble, and in 1828 was appointed conservator of MSS. in the Royal Library at Paris. He lost this position through Carnot on account of the Feb. revolution, but afterwards was made keeper of MSS. at the Bibliothèque Nationale in Paris, also prof. of palaeography in the École des Chartes. In 1849 he was appointed librarian of the palace at Fontainebleau. He wrote sev. works on historical and philological subjects, and was ed. of some of his brother's works.

Chamusa, tn. of Portugal, in the prov. of Estremadura. It is situated on the R. Tagus, 12 m. from Santarem. Wine is largely produced. Pop. 3500.

Chanak, tn. of the sanjak of Bigha, Asiatic Turkey, on the Dardanelles. The allied fleet attacked it in 1915, but without success. In 1922 it was occupied by Brit. forces in order to arrest the advance of Kemal's army. This nearly resulted in war with Turkey—or the resumption of war, for as yet peace had not been officially concluded—but the contretemps was avoided by the tact of Sir Charles Harrington, the Brit. commander-in-chief in the Black Sea area.

Chanar, old fortress and tn. of India, situated in the dist. of Mirzapur, on the r. b. of the R. Ganges. Warren Hastings lived here. There is a state prison in the neighbourhood. Pop. 6960.

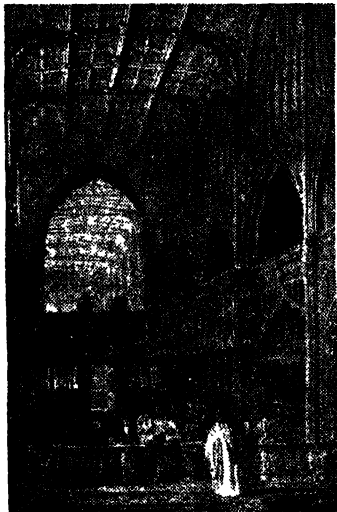
Chañaral de las Animas, tn. of Chile, S. America, situated on the coast, in the prov. of Atacama, 75 m. N.N.W. of Coplapó, and 48 m. from Caldera. It is, next to the latter, the most important port. There are copper mines in the dist. The water supply is obtained by condensation from salt water. Pop. 2000.

Chance, see **PROBABILITY**.

Chance-, or Chaud-medley (**Chaud-mellé**) (O.F. *chaude mellee*, 'heated affray'), originally meant any casual affray accompanied with violence but without deliberation or preconceived malice. The expression, though seldom used, now means the killing of another in self-defence upon a sudden and unpremeditated encounter. C.-M. is to be distinguished from manslaughter, for the latter is a crime, but the former an excusable act. The general distinction is

that, if both parties are actually fighting, he who gives the mortal blow is guilty of manslaughter, but if one of them at first refuses to fight and retreats until, at last, to avoid his own destruction, he kills his antagonist, that is excusable homicide, or, as it is inaccurately termed, C.-M.

Chancel (Late Lat. *cancellus*, a screen), the E. part of a church, usually separated from the nave by an open-work screen or rail. In some mediæval churches the screen is very high, so that the congregation is completely shut off. The choir stalls and the rector's pew are in the C.,



THE CHANCEL OR CHOIR OF MANCHESTER CATHEDRAL, AS IT APPEARED IN 1884

and the communion table on a raised platform at the far end. The term C. is often used as synonymous with choir; in small churches the space behind the screen is frequently called the sanctuary. According to Eng. law the rector has special rights over the C., is entitled to the chief pew, and is liable for all necessary repairs. Parishioners are allowed beyond the screen for the celebration of holy communion and for marriage services.

Chancellor (Lat. *cancellarius*). Primary meaning of *cancellarius* is one who is stationed at the lattice-work of a window or doorway, to introduce visitors, etc. In another sense, *cancellarius* was a kind of legal scribe, so called also from his position at the cancelli of the courts of law. The *cancellarius*, under the later emperors and in the court of Constantinople, was a chief scribe or secretary who was ultimately invested with judicial powers and a general superintendence over the rest

of the officers of the emperor. All the modern nations of Europe have or have had Cs., though the powers and duties seem to have varied in each. In England the C. was originally the king's chief secretary to whom petitions were referred, by whom patents and grants from the crown were approved and completed and by whom reports upon such matters were, if necessary, made to the king; hence in Saxon times he was sometimes styled *referendarius*. The name C. is said first to occur in Eng. hist. in the time of Edward the Elder, A.D. 920. In early times, as the C. was usually an ecclesiastic head chaplain and father confessor to the king, he became keeper of the king's conscience, examiner of his patents, the officer by whom prerogative writs were prepared, and keeper of the great seal. The last ecclesiastic who exercised the office was John Williams, archbishop of York, from 1621 to 1625.

The interference of the king, the source of justice, was frequently sought against the decisions of the courts of law; and also in matters which were not cognisable in the ordinary courts, or in which, from the maintenance of protection afforded to his adversary, the petitioner was unable to obtain redress. The Eng. C.'s jurisdiction sprang from this royal discretionary authority (see also *CHANCERY*, *EQUITY*). It may be observed that although the Eng. C.'s powers were so closely interwoven with the development of equity he nevertheless possessed at one time a political pre-eminence not only far greater than he enjoys at the present day, but second to none in the state; for on the decline of the office of chief justiciar, the C. succeeded him as the chief minister. The earl of Suffolk in the reign of Richard II., for example, exercised authority not only over revenue matters, but also over foreign policy. Like the justiciar, however, the office of C. always tended to become a purely legal one. The style of the C. in England is lord high C. of Great Britain. He takes rank above all dukes not of the royal blood and, next to the archbishop of Canterbury, is the chief judge in England, and has a seat in the Cabinet. He is appointed by delivery of the great seal, sits on the woolsack, presides at debates in the House of Lords, and goes out with the gov. A Rom. Catholic may not be lord high C. of England. The salary of the lord C. is £10,000 a year, and an ex-lord C. receives a pension of £4000 a year, but on going out of office he usually conducts a great deal of judicial work, presiding in the House of Lords, sitting as the ultimate court of appeal, and hearing appeals to the Privy Council. In the House of Lords he presides as Speaker. He is the guardian of infants and their property, and has jurisdiction over idiots and lunatics by special delegation from the Crown. He is qualified to sit in the court of appeal, and presides when he sits there, and is the titular head of the chancery div. He appoints the judges of the court of appeal and the high court and the county courts, and may

remove county court judges if necessary. He also appoints county justices of the peace on the recommendation of the lieutenant, borough magistrates, and commissioners for oaths. At the opening of a new Parliament he signifies the Crown approval of the appointment of the Speaker of the Commons, and reads the king's speech in the absence of the latter. He has the presentation of various canonries and livings, dispenses a wide patronage in addition to that already noted, exercises a concurrent jurisdiction with the other judges of the superior courts with respect to writs of *habeas corpus* (*q.v.*), and is, *ex officio*, visitor of all hospitals and colleges founded by the Crown. There was also, before the estab. of the Irish Free State in 1922, a Lord C. of Ireland, whose authority within his own jurisdiction was in most respects the same as that of the lord high C. of Great Britain. His salary was £8000 a year.

In Scotland, as in England, the C. was always a high officer of the Crown and had great authority in the king's councils; and similarly, that authority at length extended beyond its original limits and affected the whole judicial power in the kingdom. But while in England the C. for the most part only carved out for himself a jurisdiction in equity, in Scotland he reached the head of the administration in justice, and sat in a court which dispensed both equity and common law and the course of proceeding in which all the other judicatures were bound to follow. The office of C. of Scotland expired in 1707 when, by the treaty of Union with England, it was provided that there should in future be but one great seal for the United Kingdom. The C. of a bishop is vicar-general to the bishop, and presides over the bishop's consistory court. He must be a barrister of at least seven years' standing. The C. of the duchy of Lancaster is an officer who presides in the duchy chamber of Lancaster, adjudicating on equity matters connected with the Crown lands of the duchy. He is one of the titular heads of the Ministry of Agriculture. The C. of a cathedral is one of the four chief dignitaries of cathedrals of anct. foundation. The C. of the Exchequer is the prin. finance minister of the Crown. The office is sometimes held by the Prime Minister when he is a member of the House of Commons. His legal functions are now merely formal, such as presiding at the ceremony of nominating sheriffs. Constitutionally he is the under-treasurer, the office of lord high treasurer being now executed by the Lords Commissioners of the Treasury. His voice, however, may be all-powerful in connection with the Exchequer, the degree of his political eminence varying with the qualities of the individual who holds the Exchequer seat (see under EXCHEQUER, CHANCELLOR OF). The Ch. of the univ. of Oxford and Cambridge are the titular heads of the univ., and are elected by the respective corporate bodies of which

they are the heads. Their duties are mainly discharged by a vice-C. The C. of the order of the Garter and other orders of knighthood, seals and authenticates the formal instruments of the chapter and keeps the register of the order.

Chancellor, Richard (d. 1556), Eng. navigator; appointed in 1553 as captain and pilot-general of the *Bonaventure*, in the expedition of Sir Hugh Willoughby's to search for a N.E. passage to India. The ships were separated in a storm off the Lofoten Is., and C. reached Vardohuus, the meeting-place that had been agreed upon, and after waiting seven days in vain for the rest of the company, he went on alone into the White Sea, from whence he travelled to the court at Moscow, being well received there, and concluding a treaty that gave freedom of trade to Eng. ships. On a second voyage he was lost in a shipwreck off the coast of Aberdeen.

Chancellorsville, vil. of Virginia, U.S.A., situated in Spottsylvania co., between Richmond and Washington. It was the scene of one of the greatest battles of the Civil war in 1863, when Gen. 'Stonewall' Jackson received his death wound and Gen. Hooker was defeated.

Chancery (Lat. *cancellarius*, chancellor). Before the fusion of common law (*q.v.*) and equity (*q.v.*) by the Judicature Act, 1873, the Court of C. was the name given to the court which had the sole administration of equity. Since 1873, when the Supreme Court of Judicature was estab. to exercise the consolidated jurisdictions of the old courts of C., king's bench (*q.v.*), common pleas (*q.v.*), exchequer (*q.v.*), and admiralty (*q.v.*), probate, divorce, and matrimonial causes courts, the administration of equity became competent to all courts of law, and the C. div. now means that side of the high court of justice to which is assigned the trials of certain special causes. As a fact practically all matters falling within its old jurisdiction are still heard in the C. courts. The prin. matters assigned to the C. div. relate to the estates of deceased persons, partnerships, trusts, partition or sale of real estates, specific performance of contracts for the sale of land or other property, the redemption or foreclosure of mortgages, care of infants' estates, cancellation or rectification of deeds or other written instruments, and the construction of wills. It consists at the present day of five puisne judges, with the lord chancellor as titular head.

History.—The whole course of the gradual evolution of the court of C. is intimately connected with the development of equitable principles; principles which, borrowed partly from the civil and canon law, and partly from the dictates of natural justice, were designed to redress grievances for which there existed no available remedy at common law. The king as the fountain-head of justice, enjoyed the prerogative of dispensing justice personally in his royal council (*curia regis*). Later the judicial side of the royal council became specialised in the *concilium ordinarium* acting as a court of

appeal and equity, and the chancellor, as the keeper of the king's conscience and the chief legal officer of the council, presided over it in the king's absence. The old court of C. is generally believed to have been estab. in 1348 by an ordinance which vested in the chancellor plenary authority in 'matters of grace and favour.' But whether after 1348 the so-called court of C. was or was not merely the royal council, sitting in a place called 'the chancery' to hear petitions of 'grace and favour' in cases which the common law could not reach, the chancellor gradually usurped the judicial functions of the council and sat as a judge alone. The power of the court of C. after it ceased to follow the king in 1348 was developed mainly through the chancellor's delegated authority to invent new writs to meet cases for which the common law judges were unable to give redress either because of some defect of principle in the law itself, or because such remedies as it did provide could not avail against the oppression or local influence of one of the parties. During and after the end of the fourteenth century the judicial power of the court of C. increased enormously in spite of remonstrances from the common law judges and the Commons. At the time of Coke it exercised an *ordinary* or common law (*secundum legem et consuetudinem*) jurisdiction and an *extraordinary* (*secundum equum et bonum*) jurisdiction, in the former giving auxiliary remedies such as discovery of documents in cases otherwise decided on common law principles, in the latter proceeding entirely on grounds of equity. The characteristic features of its proceedings were the summons by subpoena to *appear* and *answer* without any *original writ* to the sheriff, by which means it could reach powerful personages, who defied the common law courts, and the *injunction*, by the instrumentality of which it removed causes from the common law judges or reversed their decisions, and committed a plaintiff for contempt who persisted in going on in the common law courts against conscience, and in defiance of the order of the C. court.

The constant struggles between the common law judges and the C. court culminated in the historic contest between Coke and Ellesmere in 1616, when the king pronounced in favour of the chancellor. From that time the court of C. became the dominating power in the judiciary, and the rules of equity were made to prevail over those of common law. Down to the middle of the nineteenth century the business of the court of C. was exercised by the lord chancellor, three vice-chancellors, and the master of the rolls, each occupying a separate court. There were also various officials who exercised certain parts of the equitable jurisdiction of the court, who derived their authority from special delegation of one of the C. judges. These were principally the masters in ordinary and the accountant-general. Proceedings in the old court of C. were conducted by *Bill* and *Answer*. The Bill set out the facts as

alleged by the plaintiff, prayed for relief, and concluded with a request for a subpoena to compel the appearance of the defendant for examination. The defendant's answer usually contained a demurrer (*q.v.*) to the Bill, various pleas in reply, and a denial of the truth of the allegations, with his own version of the case. Scientific precision indeed was completely subordinated to conscience, but the true spirit of equity was in a measure violated by the gradual tendency of the procedure to as complete a technicality as that of the common law. The partial fusion of administration of equitable remedies effected by the Judicature Acts has to a great extent modified the excessive technicality of the C. court, or its modern representative the C. div. It may be noted that in most of our colonies there are courts of C. based more or less on the model of the Eng. courts. In Amer. law it also indicates a court of general equity jurisdiction. Separate courts of C. or equity exist in a few of the states; in others the courts of law sit also as courts of equity; in others equitable relief is administered under the forms of the common law; and in yet others, the distinction between law and equity has never existed or has been formally abolished. The Federal courts exercise an equity jurisdiction as understood in the Eng. courts about 1689. See also BILL in EQUITY.

Chanetonbury Ring, hill on the S. Downs, in Sussex, England, near Steyning. Its tree-capped summit (814 ft.) is occupied by prehistoric earthworks and a dewpond. The oval rampart which defended it is 500 ft. by 400 ft., and its outworks measure nearly 400 ft. Rom. coins and other remains were found in 1909.

Chanda, tn. of India, in the Nagpur div. of the Central Provs. Until 1751 it was the cap. of the Gond kingdom of C. There are manufs. of silk and cotton goods and bamboo articles. A yearly fair is held which lasts three weeks. Pop. 25,000.

Chandausi, tn. of Pakistan, situated in the Moradabad dist. of the N.W. Provs., 30 m. S. of Moradabad. It exports cotton and sugar. Pop. 25,000.

Chanderi, tn. of central India, in the state of Gwalior. The old tn. is deserted and hidden in thick jungle, having ruins of tenth-century temples. The modern tn., 8 m. S., is famous for its silks and gold brocades.

Chandernagore, or properly **Chandarnagar** (city of sandalwood), Fr. settlement in the prov. of Bengal, India, 20 m. N. of Fort William, Calcutta, on the r. b. of the R. Hugli. It is the seat of a Fr. sub-governor. The settlement was founded by the Fr. in 1673. Pop. 41,000.

Chandler, Ellen Louise, *see* MOULTON, Mrs.

Chandler, Richard (1738-1810), Eng. classical archaeologist, b. at Elson, Hampshire. He was educated at Winchester and at Queen's and Magdalen, Oxford. In 1763 he pub. a detailed description of the Oxford marbles in his *Marmora*

Oroniensta, which was printed at the expense of the univ. In the following year the Society of Dilettanti sent him out with Revett and Parn to study the antiquities of Greece and Asia Minor. On his return C. pub. his discoveries in *Ionian Antiquities* (1768-97); *Inscriptiones Antiquae* (1774); *Travels in Asia Minor* (1775), and *Travels in Greece* (1776). He was given the title D.D. in 1773. See an 'Account of the Author,' prefixed to R. Churton's ed. of the *Travels*, 1825.

Chandler, Samuel (1693-1766), Eng. nonconformist divine, b. at Hungerford, Berkshire, where his father was minister. He was educated at Gloucester, where he met his lifelong friend, Bishop Butler. He became fellow of the Royal and Antiquarian Societies, and was made D.D. of Edinburgh and Glasgow. From 1716 to 1726 he was minister at Peckham, from then preaching at the Old Jewry until his death. His writings were numerous, and he took a prominent part in the deist controversies of the time.

Chandor, tn. of India, in the presidency of Bombay, 130 m. N.E. of Bombay city. It is strongly fortified, the fort being on the summit of a high hill, and it thus commands an important pass on the route from Bombay to Khandesh. It was taken over by the Brit. Gov. in 1804. Pop. 5000.

Chandos, great Eng. family, descended from a follower of William the Conqueror, of Norman times:

Sir John Chandos (d. 1429) was the last representative in direct male line.

Sir John Brydges, descendant in the female line, was lieutenant of the Tower under Queen Mary, and was created Baron C. in 1554.

James Brydges, eighth Lord C., was created duke in 1719. The C. residence, once at Canons, near Edgware, is now destroyed.

Chandpur, tn. of India, situated in the dist. of Bijnaur, 70 m. N.E. of Delhi. Pop. 12,000.

Chandragupta, or *Sandrocottus* (reigned 316-292 B.C.), founder of the Maurya empire, and first emperor of India. He was son of a king of Magadha, his mother being of humble birth. When a youth he was forced into exile by his kinsfolk, and during this period he gathered round him a great company of warriors, then attacked the Macedonians, and conquered the Punjab. He next attacked Magadha, slew the king, and estab. himself on the throne, and in due time his kingdom extended from the Hindu-Kush to the bay of Bengal.

Chandrakona, tn. of India, situated in the dist. of Midnapore, Bengal, 59 m. W. of Calcutta. Pop. 21,000.

Chang, name given to the Tibetan plateau which breaks up about the meridian of 92° E. Scientific investigations have not been systematically carried out in this region as yet, but it is known that the Himalayan tribes of the Brahmaputra derive their sources from the Tibetan plateau.

Chang Bhakar, or **Chang Bhuker**, native

state in Chota-Nagpur, India, with an area of 900 sq. m. The cap. is Janakpore, which is merely a small vil., and the state is principally jungle. Pop. 9000.

Changohiawan, small tn. in Chihli, China. It is situated about 6½ m. from Tungchou. Here a battle was fought in Sept. 1860 by the Fr. and Brit., where the Chinese treacherously captured sev. Eng. officers under a flag of truce.

Chang-Chih-tung (1837-1909), Chinese scholar and statesman, b. in the prov. of Chih-li. From 1889 to 1907 he was viceroy of Hukwang. In character he was a great dreamer and enthusiast, and very impractical. He had great literary powers, and his knowledge of the Chinese classics was unrivalled. He is said to have been one of the most able men in modern times, and his powerful personality and true patriotism won for him a high position in the regard and trust of his fellow countrymen.

Changchow, two cities in China. The first is situated in the prov. of Fukien, about 28 m. W. of Amoy. It has manufacturing of bricks and sugar, and a great silk trade. The second belongs to the prov. of Kiangsu.

Chang kia kow, see KALGAN.

Changkufeng, hill on the Russo-Manchurian border notable as the scene of a savage conflict between Soviet forces and the Jap. in 1938. Between the frontier of Jap.-controlled Korea and the Soviet area S. of Vladivostok was a sort of no man's land whose precise limits had never been clearly determined. In June 1938 the Jap. learned that the Russians were planning to estab. a new submarine and air base on Possiet Bay, at the extreme S. limit of Soviet ter. Hence they seized a hill called C., situated in the no man's land about 20 m. from the sea, which gave artillery control over Possiet Bay. The Russian frontier guard expelled the Jap. patrol which had seized C. The Jap. returned in strength and annihilated the Russian frontier guard. The Russians countered in turn, and within ten days two large armies each of 80,000 men, with planes, tanks, and heavy guns were fighting for possession of the narrow ridge of C. The battle was won by Soviet dive-bombers whose pilots had learned the methods of *blitzkrieg* in the Sp. Civil war, and by Russian infantry, who drove the Japs. into the valley below. Although the battle attracted but little attention from the rest of the world, it was an important conflict in its implications. Each antagonist evidently thought that the other was bluffing, but when the fight had developed from a mere frontier skirmish into a savage battle, both sides seem to have realised that the bluff had gone far enough and an 'amicable' settlement was reached, by which, however, the Jap., for the first time in Russo-Jap. hist., abandoned a field of battle. They recognised that the ridge of C. was Russian ter. and withdrew discomfited to the valley 5 m. to the S.W. This episode throws some negative light on subsequent Russo-Jap. relations, besides giving the Kremlin the welcome

assurance that the Red Army in Siberia was neither impotent nor demoralised at a time when the peak of misunderstanding between Soviet Russia and the rest of the world was attained. The following year the Jap. tried again, on the even more vague border-line between Inner Mongolia, which they controlled, and Outer Mongolia, controlled by the Soviet, at a place called Nomanhan. In this struggle the brunt was borne by native levies, although regular Jap. and Russian troops, with planes, tanks, and artillery, were engaged. In a 'war' which lasted six weeks, the Jap. were again defeated and again withdrew from the field. The C. affair confirmed Stalin's belief that the Soviet had been strengthened by the notorious army purge of 1936-38. He now knew, despite foreign prejudices, that his long-drawn internal struggle in Russia had been won and his Red Army in the E. could deal with the Jap. The sequel was the pact of friendship and non-aggression between Russia and Japan in 1941. There was no real friendship on either side, but actually a salient example of two countries following a policy dictated solely by their own interests. The pact was scrupulously observed for some years and led to the settlement of such vexed questions as the frontiers between Man. Lukuo-Korea and of the border between Inner and Outer Mongolia, which had never previously been determined. See W. Duranty, *U.S.S.R.: the Story of Soviet Russia*, 1944.

Changpaishan, Laoling, or Shanalin Mountains, mt. range in the prov. of Manchuria, China. It stretches in a N.E. direction between Kirin and Korea, the altitude being 8000 ft. Two rvs. have their source in the mts., the Sungari on the N. side, and the Yalu on the S.

Changsha, cap. of the Chinese prov. of Hunan, was opened as a treaty port in 1903. It exports coal. The famed anti-monopoly works of the Huachang Company, which has branch offices in the Woolworth Building, New York city, are here. There is a temple to a celebrated scholar, Yo-lo, who d. at C. in 165 B.C., in the gardens of another temple is a high school for girls, the principal of which is Miss Tseng, B.Sc. (London). There is a fine hospital erected by a graduate of Yale. C. was successfully defended against the Taiping rebels in 1852 in spite of a siege of ninety days. Pop. 535,800.

Changtsefu, two cities in China. The first is in the prov. of Honan; and the second in the prov. of Hunan, situated on the R. Yuan, which is the chief means of communication from the neighbouring prov. of Kweichow.

Chang Tso-lin (1870-1928). Chinese marshal and leader of one of the Chinese factions. Born of humble parentage and a native of Fengtien prov., Manchuria. Joined the Jap. cause in the Russo-Jap. war, 1904-5; became ruler of Manchuria in 1915. He was probably the most powerful man in China, although his insignificant and mild appearance belied his true character, for he could, it is said, exhibit the fury of a tiger. He had the

power of life and death, and used it ruthlessly. Despite this he was considered an enlightened and progressive ruler, and Manchuria was the best-governed prov. of all China. He employed many European and Amer. advisers. He hated Bolshevism, and towards the end of his regime he became cool towards his former allies, the Jap. It has been alleged that this change of front led to his elimination. He made great efforts to establish a stable gov. at Peking, but failed. In 1921 he was driven back by Wu Pei-fu to Manchuria, which he then declared independent. In 1925 he defeated Wu Pei-fu and set up a gov. in Peking in 1927. In 1928 he withdrew with the intention of going to Mukden, but the train in which he was travelling was bombed and his injuries led to his death on June 3.

Changarnier, Nicolas Anne Théodule (1793-1877), Fr. general, b. at Autun. He was for many years governor-general in Algeria, and served in the Sp. war, 1823. He later on obtained a military post in Paris, where he subdued the Communist struggles of 1849. He was arrested in 1851 for opposing Napoleon III., and exiled from France, to which he only returned eight years later, after the settlement of 1859. He joined with Bazaine in the war of 1870, and when the tn. of Metz was captured he was taken prisoner and sent to Germany.

Change (derived from Low Lat. *campium*, exchange), meeting-place for merchants. The name has been thought to be an abbreviated form of exchange and is written thus—change, but this is incorrect.

Changeling. According to fairy lore, a C. is a fairy infant substituted for a human one immediately after its birth. In olden days a child that was especially peevish was regarded as a C. Great precautions were taken in the guarding of the mortal infant, and often some charm was left in the cradle. It was supposed the exchange could only take place before the christening, and that afterwards the mortal infant was safe.

Channel, The English, see ENGLISH CHANNEL.

Channel Islands, group of Brit. is. in the Eng. Channel, W. of the Cotentin Peninsula, N.W. France. The largest is. are Jersey and Guernsey; the latter inhabited is. are Alderney and Sark. Herm, Jethou, and Bréhou have, from time to time, a few inhab. Outlying rocky islets or reefs include Burhou, the Casquets, the Dirouilles, the Erecou, Lihou, the Minquiers, and the Paternosters. **Chausey**, an extensive rocky reef, with a few inhab., lies S.W. of Jersey but belongs to France. Navigation around the coasts is difficult owing to rocks, tides, and currents. The area of the four main is. is about 75 sq. m. The total pop. is about 100,000, all except about 2000 being in Jersey and Guernsey. The is. formed part of the duchy of Normandy at the time of William the Conqueror's invasion of England in 1066. They were not included in the Eng. continental possessions lost to France in 1204 in the

reign of King John, and remained attached to the Brit. Crown, of which they are the oldest possession. The is. remained, however, in the diocese of Coutances (Normandy) until 1568, when they were brought into the diocese of Winchester. Their strategic importance in the past and their effectiveness as privateering bases brought attacks by the Fr., the last in 1781, when a landing force under de Rullecourt was routed by the Eng. garrison and the local militia in the battle of Jersey, commemorated in a painting by Copley, hung at the

cation between the is. and the home secretary. The bailiff in each bailiwick is also appointed by the Crown and combines the functions of chief magistrate and president of the legislature. Each of the four is. has its own legislature and courts. The laws and customs and political institutions vary in each is., but are all based on those of medieval Normandy, though modified in many respects by local legislation. The is. have shown great attachment to their traditional laws and forms of gov., both sustained in the past by the common



THE CHANNEL ISLANDS: PORTELET BAY IN JERSEY

E.N.A.

Tate Gallery, London. Under conditions of modern warfare the is. are untenable against a powerful enemy in occupation of the mainland of France, and shortly after the collapse of France in June 1940, they were declared by the Brit. Gov. to be open towns, and were occupied by Ger. forces. They were heavily garrisoned and fortified by the Gers., but were of little positive value to them during the war. They were peacefully liberated in May 1945. The is. have long enjoyed full self-gov., subject only to the king-in-council; they are not represented in the Parliament at Westminster and are not subject to it. The is. are divided into two bailiwicks: one for Jersey and one for Guernsey, Alderney, and Sark, the latter two is. having also their own high degree of gov. within the bailiwick, but with direct appeal to the king-in-council on some matters. A lieutenant-governor represents the king in each bailiwick and is the formal channel for communi-

cation between the is. and the home secretary. The bailiff in each bailiwick is also appointed by the Crown and combines the functions of chief magistrate and president of the legislature. Each of the four is. has its own legislature and courts. The laws and customs and political institutions vary in each is., but are all based on those of medieval Normandy, though modified in many respects by local legislation. The is. have shown great attachment to their traditional laws and forms of gov., both sustained in the past by the common

use of the Norman language, still spoken with variants in vocabulary and accent in each is. Until recent times Fr. was used exclusively in the legislatures and courts, but Eng. is now in general use. In 1946 a committee of the Privy Council visited Jersey and Guernsey and approved substantial changes, already proposed by the islanders, in the composition of the legislatures in Jersey and Guernsey, and also approved the setting up of an appeal court for both bailiwicks. The reforms in Jersey have now (1948) been constitutionally adopted, but in Guernsey they have been rejected. Reforms in Alderney are pending. The C. I. enjoy a mild climate, with moderate range and with record sunshine periods during the summer; ann. rainfall varies from 34 in. to 38 in. They have developed an intensive agriculture and a flourishing holiday traffic from England, the latter activity centred mainly in Jersey, which received 200,000 visitors in 1947. The is. attract

as residents many *rentiers* and Eng. folk living in retirement from service overseas. Glasshouse culture has developed extensively in Guernsey, because the ls. slopes northwards and is therefore less favoured than Jersey, which slopes southwards, and where outdoor intensive cultivation prevails on small holdings seldom exceeding 20 ac. The ls. enjoy long-standing privileges of exporting their crops—potatoes, tomatoes, fruit, and flowers—to the United Kingdom free from import taxes. Jersey, Guernsey, and Alderney also export considerable quantities of granite. The ls. are the homes of the well-known breeds of cattle that bear their names. The herds are strictly controlled and are virtually free from disease. The large proportion of local production exported from Jersey and Guernsey gives rise to large imports from the U.K. of food, coal, motor vehicles, feeding stuffs, fertilisers, packing materials, horticult. requisites, hardware, and general goods. Jersey and Guernsey are served by regular steamer from Southampton and Weymouth and air services from the U.K. Sark and Alderney have regular trade and communications only with Guernsey. Trade between France and the ls. is insignificant and there is a steamer service only from Jersey. Eng. currency of all denominations is used, and the 'big five' Eng. banks are estab. Jersey and Guernsey make token issues of their own copper coinage. During the Ger. occupation (1940-45) they issued their own currency notes and postage stamps. A large part of the administration of the ls. is carried out on a voluntary basis, which, with the frugal character of the islanders, accounts for the comparatively low taxation and relatively small public debt, in each is. Taxation is, however, tending to rise to meet social legislation of various kinds. The ls. have a rich flora and offer much of geological and archaeological interest, Jersey having a remarkable megalithic tomb, La Houque Bic, and a cave, La Cotte de St. Brelade, which has revealed evidence of Neanderthal man. See B. B. Elliott, *Jersey, an Isle of Romance*, 1923; E. Koord, *The Channel Islands*, 1924; T. D. Kendrick, *The Archaeology of the Channel Islands*, 1928; A. C. Saunders, *Jersey in the 18th and 19th Centuries*, 1930; B. de Guerin, *The Norman Isles*, 1948.

Channel Ports. Ger. designs on the C. P. became obvious in the early months of the First World War. Possession of them would have given Germany bases for submarines, besides offering favourable conditions for cutting Brit. communications with France. Hence the Ger. plan was to capture Dunkirk, Calais, and Boulogne and also the Belgian ports, Zeebrugge and Ostend. The menace was increased after the fall of Antwerp on Oct. 9, 1914, when the Gers. concentrated three armies, under the duke of Württemberg, Gen. von Bülow, and the crown prince of Bavaria, for a general offensive towards the straits of Dover. Ostend and Zeebrugge were evacuated and the Belgian Army retreated to the Yser. As

a fact fresh allied troops had been landed at both these ports before Oct. 9, but this had no effect on the fate of Antwerp or in protecting the retreat of the Belgians. (Consult 1914 by F.-M. Viscount French of Ypres, who expresses strong adverse opinions on the policy of directing from London the operations for the relief of Antwerp. Instead of leaving all dispositions to him and to Gen. Joffre.) In the last days of Oct. the three Ger. Armies delivered a formidable and almost simultaneous attack on the allied front extending from the Yser It., through the Ypres sector and La Bassée, to Arras. This was the inception of the first battle of Ypres, and upon its issue hung the fate of the C. P. The moment of greatest danger was during Oct. 31, when Haig, leading the 1st Corps, issued an order that the line Frezenberg-Westhoek-Klein Zillebeke was 'to be held at all costs.' Gen. French, hearing that the 1st Corps had been forced back 'after a glorious stand,' and with 'no shadow of blame upon them or their commander,' thought that the only hope of saving the C. P. was to make a stand on the Ypres-Messines line, but he doubted whether even that was possible, and viewed the situation 'with the utmost gravity.' Yet the Gers. were checked by this fateful battle. At the beginning the sorely tried Belgian Army bore the brunt of the attack, stubbornly resisting Württemberg's troops behind the Yser until such time as the Brit. warships were in position to fire on the Gers., and so compel them to withdraw. Between Nieuport and Ypres, further inland, the advance was thwarted by the desperate expedient of opening the dikes and so flooding the surrounding country. The sole gain to the Gers. in this quarter was the capture of Dixmude. Southward, the second Ger. Army, that under the Bavarian crown prince, after sev. days of fierce fighting, succeeded in advancing its positions a few miles, from La Bassée to Neuve-Chapelle; but this proved the limit of its advance to the C. P. The Third Ger. Army, under von Bülow, operating still further S., could make no headway against the Fr. in front of Arras. The fiercest fighting in the whole battle was near Ypres, the attacks on the Brit. forces being repeated and long-drawn; but though the Brit. line was driven back some little way, it was never pierced. The historic effort of the Gers. to take the C. P. had thus definitely failed. A further effort was made in 1918 in the course of the final Ger. offensive, but the attack was launched from motives of despair. When they were held before Amiens (q.v.), the Gers. delivered a great assault against the Brit. line between Arras and the region N. of Ypres, the plan being to separate Plumer's Second Army from Horne's First Army, the attempt to drive a wedge between the Fr. and Brit. having failed. Success would have jeopardised Calais, for an advance in any way comparable to that already made in the Amiens sector would have involved first Hazebrouck and then Ypres. But though

the Brit. line sustained a terrific battering at Passchendaele Ridge, and lost many important positions, they still dominated the strategic railway lines from and to Amiens, Arras, and Ypres, and the Gers, despite prodigious losses in men, were no nearer the C. P. At the same time, too, they had lost the Belgian ports as effective bases for U-boat operations, owing to the Brit. Navy sinking ships in the harbours of Ostend and Zeebrugge (see also VIN-DICTIVE; ZEEBRUGGE).

Second World War.—In the Second World War all the C. P. were taken by the Gers. in the course of the campaign on the W. front in 1940, and on May 21 the R.A.F. were attacking some of the ports which were then in Ger. hands. Boulogne was taken by the enemy on May 24. Ostend fell on May 29, and on 30th the Brit. expeditionary force was evacuated from the Dunkirk beaches. See further under WESTERN FRONT IN SECOND WORLD WAR.

Channel Tunnel. The project, known as the C. T. scheme, to connect England and France, is now over one hundred years old and has had a chequered career. It is not due to any engineering difficulty that it still remains merely a project, for the best engineers of both countries are convinced of its feasibility, but to political and economic factors, which, in Great Britain at any rate, have led the responsible chiefs of all parties to refer the scheme to committees. M. Mathieu, a Frenchman by birth, was the first to propose submarine communication with England. He laid the suggestion before Napoleon I that a roadway should be built under the Eng. Channel, and that locomotion should be carried on by means of horses. After railways had come into vogue, it was suggested by some Eng. and Fr. engineers that a tube should be laid along the bed of the sea. Wm. Low, in the year 1867, thought that two single-line tunnels, with numerous passages to connect them, could be engineered. At the Paris Exhibition of that same year a model of a tunnel was shown by Thome de Gamond, and in 1872 the Eng. C. T. Company was formed. The scheme was set on foot, and operations begun at Samzatte, near Calais, and Shakespeare's Cliff, near Dover, headways having been bored for 2000 yds. under the sea at each end. But the plan was not allowed to proceed, for the Eng. military authorities refused to sanction it, saying it would greatly increase the necessity for defensive precautions, and Parliament also strongly opposed the scheme. During the experimental proceedings coal was discovered near Dover. In May 1904 the Paris chamber of commerce passed a resolution strongly advocating the scheme, and the C. T. Company, an offshoot of the original company known as the Submarine Continental Railway Company, founded in 1881 (this company is still in existence, there being one surviving (1940) shareholder), in recent years showed intention of once more approaching Parliament on the subject. It will be seen from the foregoing that the safety of the country

was the determining factor in the refusal of successive Brit. Govs. to sanction the scheme. The military authorities were loath to permit of any project that would deprive Great Britain of the advantages due to her insular situation. But in the twentieth century new factors came into the consideration of the problem even from a strictly military standpoint. First there was the invention of the aeroplane, which caused people to say, especially after M. Blériot had first flown over the Eng. Channel in 1909, that England was no longer an island. Next came the First World War with the submarine warfare of Germany on Brit. shipping, which greatly hampered the forwarding of supplies to the Brit. Army and its allies. After the war the allied generalissimo, Marshal Foch, is reported to have stated that had the C. T. been in existence in 1914 the war might have been shortened by one-half, and that such a tunnel 'would make war in W. Europe impossible.' The Brit. generals, Lord French, Lord Kitchener, and Sir Henry Wilson, declared, on the contrary, that the tunnel would have been a handicap in the war. Finally, since the inception of the *entente cordiale* in 1903 France, the 'historic enemy' of England, 'has become an ally in war and peace. Among economic factors that led after the war to a revival of the agitation in Great Britain in favour of a C. T. was the idea that the undertaking of so large a scheme would assist trade and employment and that it would encourage tourists, fearful of sea-sickness, to visit England. For this reason the great London drapers advocated the scheme, and some London newspapers lent their support. The rival scheme of a channel train ferry, which became an actuality during the last year of the First World War, is an economic factor adverse to the tunnel, and the increasing air transport has led to further economic doubts. A committee appointed by the Labour administration reported in 1930 that there were certain economic advantages in the scheme, but on June 30 of that year the House of Commons, taking its cue from the Premier, Mr. MacDonald, rejected the project by the narrow margin of 179 votes to 172. The Fr. Gov. still attaches great importance to the scheme, as was indicated by the fact that the Chamber has passed a favourable vote on it, which was strongly supported by the foreign affairs committee. The fact, too, that Gen. Weygand joined the board of the C. T. Company is further proof of Fr. military interest in its strategic value. It remains to be added that the Brit. scheme was for a tunnel 30 m. long (of which 20 would be under the sea), costing about £30,000,000 and taking five or six years to build. M. Dautry, chairman of the Fr. C. T. Committee, suggested much the same length and cost, the depth of the lowest portion of the tunnel in his scheme being about 300 ft. below sea level, and he quoted a Franco-Brit. expert agreement to the effect that the receipts for the first year would be

about 557,000,000 francs and that the tunnel would be financially self-supporting. Just before the Second World War, M. André Boisdévant aroused interest by his detailed plans for a 30-in. road tunnel with a road width of 22 ft. and a height from road level to roof of 18 ft., the deepest point being 450 ft. below sea level, and the route being from Marquise, under Cap Gris Nez, to near Folkestone, the estimated cost being £12,000,000. There appears to be no insuperable difficulty (apart from the glacial moraine which is said to exist in the centre of the channel), from the engineering standpoint, in the construction of a C. T., the chalk substratum of the channel bed being eminently favourable to boring operations. According to the C. T. Company, the appropriate plan would be to bore two traffic tunnels, 18 ft. in diameter, with a pilot tunnel of about 12 ft. diameter. It is estimated that the yearly gross revenue from the tunnel, based on the average present ocean passage rates, would be about £4,000,000 and the net profit, £3,000,000.

Channing of Wellingborough, Sir Francis Allston, first Baron (1811-1926), Eng. politician, was b. in U.S.A., son of the Rev. Wm. Henry C. He was educated at Exeter College, Oxford, and was tutor and lecturer in philosophy at Univ. College in the same univ. Married in 1869 Elizabeth Bryant of Boston, U.S.A. He took an active part in promoting agric., educational, and labour reforms. He was a member of the Royal Commission on Agric. Depression, 1893-96, and chairman of the Central and Associated Chambers of Agriculture in 1891. He wrote *Instinct, The Greek Orators as Historical Authorities; The Second Ballot; The Truth about Agricultural Depression* (1897); *Memories of Midland Politics* (1917), etc. He was made a baronet in 1906, and a peer in 1912.

Channing, William Ellery (1780-1842), eminent Amer. Unitarian preacher and writer, b. at Newport, Rhode Is. He graduated at Harvard in 1798, and in 1803 became minister of the Federal Street Congregational Church, Boston, where he acquired a great reputation for eloquent preaching. C. became involved in a controversy in which he was called the 'apostle of Unitarianism,' although he himself objected to the term in the sense it is commonly used. C. had a gentle, pious nature, and shrank from eccles. quarrels, and had little sympathy with those who preached dogma, of whatever kind. He preached and wrote vehemently against intemperance, war, slavery, and oppression. While on a visit to Europe he met many Eng. authors, notably Wordsworth and Coleridge. His works include *Remarks on National Literature* (1823); *On the Character and Writings of John Milton* (1826); *On the Character and Writings of Fénelon* (1829); an essay on *Negro Slavery* (1835); and *Self-culture and the Elevation of the Masses* (1838). His complete works were pub. in five vols. in 1841, and in 1875 were reprinted in one vol. His sermons were collected and pub.

in 1872. See life by his nephew, Wm. Henry C., 1848, and that of J. W. Chadwick, 1903.

Chansons de Geste (Lat. *gesta*), name given to long narrative poems written by the *trouvères* of N. France from the eleventh to the fifteenth century, in number about 110 according to Gautier. Probably as early as the ninth century epic poems began to be known, as chanted by the minstrels, or *jongleurs* as they were called. The earliest known chanson in existence, the *Chanson de Roland*, is by far the most famous and noblest of them all, which appears to have been written between the years 1066 and 1095. Most of the C. are divided into three cycles, that of Charlemagne, of Doon de Mayence, and Garin de Montglane; there are also lesser cycles, such as Garin de Lorraine, and all are connected one with another. Probably the most important cycle was that one which gave an account of the doings of Charlemagne, and was known as the *Geste du Roi*. It described the life of the mother of Charlemagne, as well as that of the emperor himself. Another interesting cycle is that of *La Geste de Guillaume*, which tells of the brave men of the S. who render faithful service to the throne. There are a great number of poems belonging to this cycle, and are some of the earliest now extant. The subjects of these *chansons de geste* are nearly all taken from Fr. hist., and written in verses of ten or twelve syllables. Their general character is inclined to hardness and coarseness, want of art and very little grace, but there is great energy; they are full of Gallic strength and force. Their literary value and historical interest are very considerable; the customs and ideas of the times in which they were written are faithfully reproduced, and their popularity spread into England, Italy, Spain and even Iceland. Very many of the surviving poems were never pub.

Chant, in church music a species of melody used in cathedrals and other churches between an air and a recitative, to which the psalms of the day and canticles, etc., are sung. In the Church of England the psalms are usually chanted, while in some nonconformist churches certain passages of Scripture are also chanted. The earliest form, the Ambrosian C., introduced by St. Ambrose, of Milan, was superseded by the Gregorian C. or plain-song system of antiphonal psalmody as devised by Pope Gregory I. In this system eight groups of chants correspond to the eight modes or tones (represented on the piano by the white notes). The C. begins with an intoning note and then a reciting note, followed by the mediation marking the half of the C., a reciting note and the termination. In the Anglican C. the main principle is that of the traditional Gregorian tones. See also PLAIN SONG, PLAIN CHANT, or GREGORIAN CHANT.

Chant, Mrs. Laura Ormiston, née Dibdin (1848-1923), Eng. social and political reformer. She was b. at Chepstow, and prior to her marriage had been assistant

managers in an asylum and also a school-teacher. She lectured in different parts of the world on woman's suffrage, temperance, liberalism in politics, and many other subjects. In 1895 she began to attack the London music-halls on the ground of social purity. She was a writer of songs and of pamphlets on social questions.

Chantabun, prin. tn. of the prov. of C., on the E. side of the gulf of Siam. It has been a stronghold of the Rom. Catholic missionaries since the seventeenth century, and is considered to possess a stronger Christian element than any other place in Siam (Thailand). There is considerable export trade in rosewood, dyewoods, timber, ivory, hides, gum, and horns, and there are mines of precious stones in the vicinity. Pop. 5000.

Chantada, tn. of N.W. Spain in the prov. of Lugo. It is situated on the l. b. of the Rio de Chantada, and on the main road from Orense to Lugo. There is considerable trade in hemp, flax, grain, and dairy produce. Pop. 15,000.

Chantarelle, see CHANTERELLE.

Chantelauze, François Régis (1821-88). Fr. historian. b. at Montbrison, Loire. He brought out many works, the majority of which deal with the seventeenth century. His most important writings are *Le Cardinal de Retz et l'affaire du chapeau* (1878); then in 1879, *Le Cardinal du Retz et ses missions diplomatiques à Rome*. He had previously pub. (1876) *Marie Stuart: son procès et son exécution*. All these books were crowned by the Fr. Academy. He also brought out others over which there was much controversy.

Chantenay, until 1908, a tn. of France in the dept. of Loire-Inférieure, situated on the R. Loire, 2 m. W. of Nantes of which it now forms part. There are large brandy distilleries, iron foundries, forges, shipbuilding works, etc.

Chanterelle, Chantarelle, and **Chanterella**, popular renderings of the name *Cantharellus cibarius*, an edible mushroom which resembles *Agaricus*. In colour it is a bright orange, the cap is irregularly-shaped, the gills are thick and wrinkled, and the whole plant has a pleasant fruity smell.

Chantilly, com. in the dept. of Oise with a celebrated chateau. Rebuilt between 1527 and 1532 and restored by the duc d'Anjou in 1876-82. In 1886 the duke presented it, and the invaluable collections housed in it, to the Institute of France. There is a famous racecourse in the grounds of the chateau. Pop. 6000.

Chantrey, Sir Francis Legatt (1781-1841), Eng. sculptor. b. at Norton, Derbyshire. He began life in humble circumstances, his father being a carpenter. He was left an orphan at the age of twelve, but was befriended by a wealthy lady in the neighbourhood, and in 1797 was apprenticed to a wood-carver, frame-maker, and gilder in Sheffield. Here he began modelling in clay and drawing pencil sketches, which attracted the attention of John Raphael Smith, the mezzotint engraver, who gave him some lessons in portrait painting. In 1803 he came to

London and studied at the Royal Academy, where his first work, a 'Portrait of D. Wale, Esq.,' was exhibited in 1804. His work was well received, so that in 1809 he received a commission to execute colossal busts of Brit. admirals—Howe, Vincent, Duncan, and Nelson—for the Greenwich Hospital. In 1808 he received an order for a statue of George III. to be placed in the Guildhall. His reputation for portraiture was estab., and he executed busts or statues of most of the prominent men of his time. His busts include those of Sir Walter Scott (two, 1820 and 1828), James Watt (Westminster Abbey), and Wordsworth; his chief statues are Sir Joseph Banks (1827), Washington (in Boston), the duke of Wellington (in front of the Royal Exchange, London), George IV., Canning, and Roscoe (Glasgow). His statue-group of the 'Sleeping Children' in Lichfield Cathedral is well known. C. bequeathed his fortune to the Royal Academy, to be partly expended on the purchase of works of art executed in Great Britain. See J. Holland, *Memorials of Chantrey*, 1851; G. Jones, *Sir Francis Chantrey*; and D. S. MacColl, *The Administration of the Chantrey Bequest*, 1901.

Chantrey Fund. This fund was estab. by the bequest of Sir Francis Chantrey, R.A., under which £105,000 was invested in consols, the available income being then about £3000. The first purchases out of the fund were made in 1877, and the collection, which now comprises over 437 works, has since 1898 been permanently housed in the Tate Gallery. In 1903 complaints with regard to the Chantrey bequest were raised on the ground that the committee was too exclusive in its choice of artists, and since then various changes have been made in the composition of the selection committee. At present it consists of two joint committees for painting and sculpture, each composed of three members of the Academy and two of the Tate Board; proposals for purchase come before the Academy Council, who retain the power of approval or rejection.

Chantry (O.F. *chanterie*, Lat. *cantare*, to sing), term applied to a chapel or altar where masses may be sung for the repose of a soul. C. chapels are often built off the aisle or nave of a church, and have the tomb of the founder placed in the centre. The word C. is also applied to the endowment for the upkeep of such a chapel. See G. H. Cook, *Medieval Chantries and Chantry Chapels*, 1941.

Chanute, city of Neosho co., Kansas, U.S.A. It is in the Kansas Oklahoma oil and gas field, is the centre of a splendid farming region, and much dairy produce is obtained. C. was incorporated as a city in 1873. In 1899 natural gas and oil were discovered. Pop. 10,000.

Chanzy, Antoine Eugène Alfred (1823-1883), Fr. general. b. at Nourit, Ardennes. He was present at Magenta and Solferino in 1859. He had about thirty years' service in Africa, on his return from which he commanded the second army of the Loire in the Franco-Prussian war in 1870. He was ambas. to Russia, 1879-81, and

was nominated as president of the republic in 1879.

Chaochow, city of China, in Kwangtung prov., situated on the It. Hankiang, near where it flows into the China Sea.

Chaoking, city of China, in Kwangtung prov. It is situated on the West It.

Chaones, people who lived in Epirus in the N. of Greece; thus Epirus is occasionally called Chaonia.

Chaos, term given by the Gks. to the space and void which existed before the universe was made. Literally means 'a yawning.' C. is said to be the mother of Erebus and Nox (Darkness and Night).

Chapala, lake in Mexico, with an area of 1300 sq. m., situated between Guadalajara and Michoacan. There are numerous is., and the Rio Grande flows through it.

Chaparral, tn. in Colombia, 115 m. from Bogotá. It is rich in copper, iron, coal, and petroleum. It stands at an altitude of 2740 ft. Near by are the painted rocks of Alpe and a peculiar grotto. Pop. 7000.

Chapbooks, or **Broadsides**, term believed to have come into use in the reign of George IV., and applied to small pamphlets which at that time were the chief form of literature that the poor people enjoyed, not only in England but on the Continent. In Germany they were called *Volksbücher*, first printed in France for the populace after the invention of the printing press. The beginning of the seventeenth century is said to be about the time of their advent into England. Early in the sixteenth century some of these books were devoted to the interpretation of dreams, palmistry, astrology, etc., while others were such tales as *Jack the Giant Killer*, *Patient Grizel*, *Reynard the Fox*, etc. In Scotland a number of more or less religious books were in vogue, especially the 'prophecies' of Peden. Then humorous books were always favourites, among them being *The Merry Exploits of George Buchanan*. Thackeray describes the Irish C. in his *Irish Sketch Book*, chaps. xv., xvi.

Chapel (printing house), see FATHER OF THE CHAPEL.

Chapel (O.F. *capelle*, from Lat. *capella*, a sanctuary), building that is used for worship. Cs. were attached to cathedrals, churches, and abbeys as early as the tenth century, and were dedicated to some saint. An altar and relics of the saint were placed in the C., so that private devotions or special services might be held there. The central C. was often called the lady C. because it was dedicated to the Virgin Mary. Cs. might also be erected to hold the tombs of private individuals, as Henry VII.'s C., added in 1502-20 to the E. end of Westminster Abbey. Cs. were also built by private families on their own estate, and by colleges and guilds. Modern colleges and schools frequently have Cs., in imitation of those at Oxford and Cambridge. The term C. is also applied to places of worship built by nonconformists, as distinct from those consecrated according to the laws of the Church of England.

Chapel Royal, of England, the date of whose foundation is not certain. It is

known, however, that it was in existence at the time of Edward IV. It is composed of a dean, sub-dean, and fifty-eight clergymen, ten of whom are called priests in ordinary. Like the Ger. *Kapelle*, it is to be understood not as a building but as a body of clergy and musicians. Its purpose was to attend on the sovereign, wherever he or she might be. In former years it existed in the chapel at Whitehall, but now it never holds a service anywhere but in the chapel known as the C. R. at St. James's Palace, London. 'The Chapel Royal, as an institution, has been of the greatest value in fostering English musicianship and in promoting the development of English music' (Scholes).



John H. Stone

CHAPEL ROYAL, ST. JAMES'S PALACE

There were thirteen minstrels and eight choir-boys in the C. R. of Edward IV., and in the fifteenth century began the custom of the musical members performing 'interludes' before royalty. The C. R. under Elizabeth was especially distinguished, for its church music was not inferior to that of the musicians of the Sistine Chapel. In the late seventeenth century Purcell was 'composer in ordinary' to the chapel. If the brightest days of the C. R. in developing Eng. music had passed in the late eighteenth century, there were still accomplished organists whose names are familiar to every student of Eng. musical hist.

The C. R. of Scotland was founded by Alexander I. at Stirling Castle, but Mary had it removed to Holyrood. The chapel now consists of the dean, appointed by the sovereign, and six chaplains in ordinary who attend on the king when he is at Balmoral Castle. Any money that belongs to the chapel is given for salaries for chairs of divinity in connection with a univ. The name used to be given to Holyrood Abbey Church, which is now in ruins.

Chapelain, Jean (1595-1674), Fr. literary critic who first came into notice

through his preface to the *Adone* of Marino in the year 1623. He was considered quite the chief of Fr. poets, and every one thought that his *Pucelle*, which was one of the pseudo-epics of that time, would equal the *Hiad* or *Æneid*. The popularity of this work, however, did not endure, and after the praise bestowed on the issue of the first twelve cantos in 1636 had subsided, his fame gradually dwindled, and he was laughed at by the younger poets such as Boileau. Under the patronage of Richelieu, however, he was prominent in founding the Academy, and it is to him that the rules of the 'three unities' were formally estab. in Fr. drama. The last twelve cantos of *La Pucelle* were not pub. until 1882. His most important work is *Séductions de l'Académie sur le Cid*, which he brought out in 1637.

Chapel-en-le-Frith, tn. and par. in High Peak div. of Derbyshire, England, 4½ m. N. of Huxton. Pop. 3000.

Chapelhall, vil. in Lanarkshire, Scotland. There are collieries and ironworks in the neighbourhood.

Chapelle Ardente, chamber, catafalque, or bier for the lying in state of exalted persons, lit with candles. In Westminster Abbey, at the Crossing, dead kings lay in effigy under elaborate canopies or 'hearses,' supporting a multitude of candles. The effigies, carried at the funerals, represented the actual corpse. Henry VII. provided by his will that at his funeral a hearse should be set up, with 100 tapers and four great candles in the lantern space, until the king's great chapel was finished (see under WESTMINSTER ABBEY). The hearse of Edmund Crouchback (earl of Lancaster) had no fewer than 559 candles, an odd number which suggests that there was a single one at the apex. This custom is first recorded as occurring at the obsequies of the Frankish king, Dagobert I., in the seventh century. See W. R. Lethaby, *Westminster Abbey Re-examined*, 1925.

Chapelle St.-Denis, anct. com. of Seine, France. It was united to Paris by an imperial decree of 1860, and now forms part of the eighteenth arron.

Chapelton, eccles., par in the W. Riding of Yorkshire, England, 6 m. N. of Sheffield. There are collieries and iron foundries, and bricks, tiles, etc., are manufactured. Pop. 9000.

Chaperon (Fr. hood) has a variety of meanings: (1) It is the name often given to the plumes seen on horses' heads in funeral or other processions. (2) Also applied to the cap, which is worn by members of the Eng. Order of the Garter. (3) It is the name given to the academic hood worn by all people who have taken a degree of any kind, such as Doctor of Music, Bachelor of Arts, etc. (4) Most commonly known as the term applied to a married lady who is acting as 'guardian' to an unmarried woman when appearing in public. This custom arose in the reign of Queen Anne. Prior to this no unmarried girl or woman could appear in public except under the guardianship of a near relation.

Chaplain, term employed for a clergyman serving in some official capacity. Thus, in civil life, there are Cs. of the Chapel Royal, of prisons and workhouses, and, in an almost obsolete sense, of the households of noblemen. But the word is most commonly used in connection with the armed forces. In the Brit. Army there are regimental Cs., i.e. clergymen specially commissioned for military service, and having the status of a non-combatant officer. The service is under a military dept. of the War Office, and is governed by a C.-general, with the rank of a major-general, who has jurisdiction over the Anglican Cs., who form the majority. Rom. Catholic and Presbyterian Cs., who are commissioned for regiments where most of the men are of one of these faiths, are under the authority of the secretary of the War Office. Cs. are of four ranks, corresponding to colonels, lieutenant-colonels, majors, and captains. Their duties are to accompany the troops on active service, and in times of peace to hold divine service, officiate at funerals, etc., visit the men, and generally act as par. priests to the military stations to which they are allotted. Every large ship in the navy has an Anglican C., who must not be over thirty-five years of age on entering the service, and who retires at sixty. Cs. who also act as naval instructors receive special allowances. The head of the service, the C. of the fleet, is paid £1358, the same as that of the C.-general. Naval Cs. are members of the gun-room or wardroom mess, and their duties include the holding of services on board, visitation of the sick, and assistance in the maintenance of moral discipline among the men. During the First World War a great expansion of the Cs. Dept. took place as a result of the numerous new units brought into existence, the estab. of hospitals both in the field and at home, and of the casualties among Cs. themselves. By 1915 the nonconformist churches and churches of the Jewish religion had Cs. on the regular estab. of the army, and before the end of the war the Salvation Army was similarly represented. Most of the Cs. were in France and Flanders, but wherever there were Brit. troops Cs. accompanied them. They shared in the dangers in Italy, Macedonia, E. Africa, Egypt, Palestine, Iraq, and on hospital ships. Besides looking after the spiritual welfare of the army, Cs. rendered a great service by arranging concerts and performing many other social services. The fine services of the Brit. Army Cs. Dept. was marked by His Majesty King George V. in 1919 by granting the title of 'Royal' to the dept. which then became the Royal Army Cs. Dept. During 1930 a C.-commandant was appointed to the dept. and a new badge approved. In the Second World War there was a similar expansion of the Cs. Dept. and Cs. accompanied the troops to N.W. Europe, N. Africa, Italy, and Burma.

Chaplain, Jules Clément (1839-1909), sculptor of medals and busts, deserves honour because he restored to its earlier

dignity the fallen art of engraving on medals. Thus he executed a series for various societies and functions, including one for the Universal Exhibition of 1867, another in commemoration of the resistance of Paris, a third for the Salons, and a fourth to be given as a recognition for acts of heroism. Among his medallion portraits are those of Meissonier, Renan, and Gambetta. *D.* at St. Germain-des-Prés.

Chaplin, Charles (1825-91), Fr. painter, *b.* at Andelys (Eure) of Eng. parents. He soon found that his real vocation lay in painting portraits of women in the Watteau and Boucher style. He managed to catch the piquant charm of Parisian women in his pictures. In 1860 he painted the apartments of the Empress Eugénie at the Louvre, and afterwards the bathroom at the Élysée. His best works are 'Les Bulles de Savon,' 'The Birth of Venus,' 'The Bath,' and 'Rising in the Morning.' He was also an excellent engraver, and made engravings of many of Decamp's and Watteau's pictures, and also of some of his own.

Chaplin, Charles Spencer ('Charlie Chaplin'), cinematograph actor and producer, *b.* April 16, 1889—in France, according to some—son of Charles C., a variety comedian. His boyhood's home was in the Kensington neighbourhood, S. London. He went on the stage at the age of seven, and in 1899 appeared in music-halls all over the United Kingdom as one of 'Eight Lancashire Lads.' He appeared at the opening of the London Hippodrome, Jan. 15, 1900, in *Giddy Ostrich*. He then entered the company touring with Wm. Gillette's version of *Sherlock Holmes*, as Billy. He appeared in London at the Duke of York's Theatre, Dec. 27, 1904, as one of the wolves in the first production of *Peter Pan*. On Oct. 3, 1905, he acted Billy in the *Painful Predicament of Sherlock Holmes*, with Wm. Gillette and Irene Vanbrugh. He first appeared in the U.S.A. in 1910 with Fred Karno's company; and his connection with the films began through Joseph M. Schenck, who engaged him for the Keystone Company at Hollywood. Until recently he always kept to the same get-up. His little round hat, smudge moustache, slack trousers, and long-toed boots, his flat-footed gait and imperturbable impassivity, gradually became so famous that, at the beginning of the First World War, no personality was more familiar to the Eng.-speaking world. He had his own producing organisation and studios at Hollywood. Some of his films are *Shoulder Arms*; *The Kid*; *Idle Class*; *Pay Day*; *The Pilgrim*; *The Gold Rush*; *The Circus*; *City Lights*. He staged, but did not appear in, a serious film, *A Woman of Paris*. His film *Modern Times* was shown in London in 1936; *The Great Dictator* in 1940; and *Monsieur Verdoux* in 1947.

Chaplin, Henry, first Viscount (1810-1923), Eng. statesman, *b.* Dec. 22, 1840, second son of the Rev. Henry C. of Blankney, Lincolnshire, and was educated at Harrow and Christ Church, Oxford.

He first went into Parliament in 1868, as Conservative member for Mid-Lincolnshire. There he remained till 1906, when he was defeated; but he re-entered again in 1907 in a by-election, member for Wimbledon. He was a well-known figure on the racecourse, and his horse Hermit won the Derby in a snowstorm in 1867. He took a great interest in agric. questions, and was a typical specimen of an 'Eng. country gentleman.' In 1889 he became president of the new Board of Agriculture, with a seat in the Cabinet, and he kept this position till 1892. He was always an advocate of Protection; and when Joseph Chamberlain began his Tariff Reform campaign, C. was one of its most ardent supporters. He was President of the Local Government Board 1895-1900, and was responsible for the Agric. Rating Act. In 1916 he was raised to the peerage. See Marchioness of Londonderry, *Henry Chaplin*, 1948.

Chapman, small itinerant tradesman. In the eighteenth century he sold chap-books, needles, laces, linen, and all sort of things, and bought up old brass, old clothes, and sometimes human hair.

Chapman, George (1559-1634), Eng. dramatic poet and translator of the *Iliad* and the *Odyssey* of Homer. *b.* at Hitchin, Hertfordshire. (Anthony Wood is responsible for the very dubious connection with Kent.) A fine classical scholar, he was educated at Trinity College Oxford, which he left for London about 1576. Here he settled at once to a literary career, was patronised by Sir Thomas Walsingham, Henry, Prince of Wales, and Carr, earl of Somerset, and became friendly with Shakespeare (C. has been plausibly identified with Shakespeare's rival poet of the *Sonnets*). Spenser, Daniel Marlowe, Jonson, and Inigo Jones, the architect, who after his death designed a monument for him in St. Giles-in-the-Fields. His trans. of Homer, the earliest in Eng., appeared in various parts, the *Iliad*, 1598-1611, and the *Odyssey* in 1614-15. These trans. occupied his leisure through much of his lifetime. His version of Homer is one of the most faithful to the original we possess in verse, but his *Iliad* loses much of the fire and spirit of Homer by reason of his metre which is the fourteen-syllabled rhyming line of Drayton's *Polyolbon*. It was warmly praised by Dryden, Pope, and Coleridge. His version of the *Odyssey* is in ten-syllabled heroic couplets and is hardly less deserving of the same high praise. His first play was a comedy, *The Blind Beggar of Alexandria* (1596), which, like its successor, *A Humorous Day's Mirth* (1599), is poor. But his *All Fools* (1605) is entertaining comedy, with ingenious situations, sprightly characters, and a well-constructed plot. *The Gentleman Usher* (1606) and *Monsieur d'Olive* (1606) have some good features, but are defective in construction. *The Widdowes Teares* (1612) is also among his better comedies. The comedy, *Eastward Hoe* (1605), regarded as his best, was written in conjunction with Jonson and Marston and was the inspiration of Hogarth's

'Idle Apprentice.' Many of his tragedies deal in a spirit of tolerance with contemporary Fr. affairs, and are melodramas of bloodshed, with many horrors, no little rant and fustian, and with but deficient skill in characterisation. Among his tragedies are *Bussy d'Ambois* (1607); *The Conspiracy, and Tragedie of Charles Duke of Byron* (1608); *The Revenge of Bussy d'Ambois* (1613); and *The Warres of Pompey and Cæsar* (pub. 1631 but probably written much earlier). He also pub. sev. other trans. and various poetical works, including the euhuistic *Ovid's Banquet of Sense* (1595), the conclusion of Marlowe's *Hero and Leander* (1598), *The Tears of Peace* (1609), a dignified funeral song in memory of Prince Henry (1612), and a masque performed by the societies of Lincoln's Inn and the Middle Temple to celebrate the betrothal of the Palgrave and the Princess Elizabeth in 1613. See T. M. Parrott, *Plays and Poems*, 3 vols., 1910-14; R. L. Hine, *Hitchin Worthies*, 1932; H. Ellis, *George Chapman*, 1931; P. Brooks Bartlett, *Poems*, 1942.

Chapman, John (1801-54), Eng. political writer, b. at Loughborough in Leicestershire. He failed in business, which was that of a lace manufacturer, in 1834, and went to London and became ed. of the *Mechanics' Magazine*. He invented improvements in the 'four-wheeler,' which eventually led to the hansom cab. He wrote *The Cotton and Commerce of India* in 1851.

Chapman, Sir Sydney John (b. 1871), Eng. economist, b. at Wells, Norfolk. Educated at Manchester Grammar School and Cambridge Univ. Prof. of Political Economy, Owens College, Manchester, 1901-17. Permanent under-secretary Board of Trade, 1920-27; chief economic adviser to the Brit. Gov., 1927-32. Chairman of the Imperial Economic Committee, 1931-32. Pub. *Outlines of Political Economy* (1911).

Chapman, Walter, see CHEPMAN.

Chapone, Hester, *née* Mulso (1727-1801), Eng. essay writer, and an ardent admirer of Richardson the novelist. She wrote *Letters on the Improvement of the Mind* in 1772, and this was very popular in girls' educational circles. This essay was very often found bound up with Dr Gregory's *Advice to a Daughter*. Her complete writings may be found in vol. xviii. of Chalmers's *British Essayists*, 1856-57.

Chappe, Claude (1763-1805), Fr. mechanician, b. at Brulon, Normandy, the nephew of Abbé Chappe d'Auteroche, the astronomer. He was the inventor of a form of telegraphic communication founded on the theory of Robert Hooke (*q.v.*) (1684) as modified and practically demonstrated by Guillaume Amontons (*q.v.*), which he presented to the National Assembly in 1792. It was successfully tried between Paris and Lille, and soon came into general use.

Chappell, William (1582-1649), bishop of Cork and Ross. He was b. at Laxton in Nottinghamshire. Archbishop Laud favoured him, and through his influence

he was made dean of Cashed in 1633. Afterwards he was provost of Trinity College, Dublin, from 1637 to 1640, and then bishop of Cork and Ross in 1638. After Strafford's fall, he was put into prison for a short time in Dublin in 1641 and at Tenby in 1642.

Chappell, William (1809-88), Eng. musical antiquary. He managed his father's business (a firm of piano-makers). He pub. *A Collection of National English Airs, consisting of Ancient Song, Ballad, and Dance Tunes*, in two vols., between 1838 and 1840, which he afterwards extended and reissued under the name of *Popular Music of the Olden Time* (1855-1859). In 1841 he founded the Musical Antiquarian Society, as well as the Percy Society. For this latter society he ed. Dowland's songs, and assisted in the preparation of the *Percy Folio* in 1868. He also produced (1871-75) in three vols. his notes on the *Roxburghe Ballads*, of which only one vol. was pub., which contain a vast amount of archaeological information. He also projected a *History of Music*, of which only one vol. was pub. in 1874.

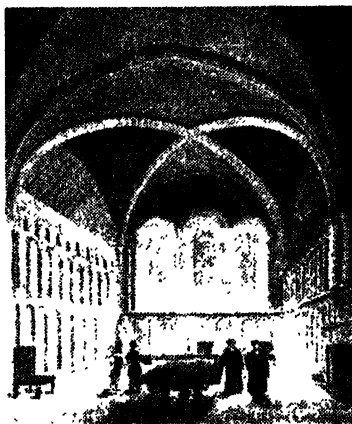
Chapra, or Chupra, chief tn. in Saran dist. in Bengal, India, 32 m. from Patna. It has lost its commercial importance, but still has many banking houses. Pop. 45,000.

Chaptal, Jean Antoine, Comte de Chanteloup (1756-1832), Fr. chemist and statesman, b. at Najaert, Lozère; graduated in medicine at Montpellier in 1777, and settled to scientific study in Paris. In 1781 he became prof. of chem. at Montpellier, and made many discoveries of considerable commercial value. Though in the main a supporter of the revolution, he was imprisoned by the popular party in 1793, but was soon released to become director of the salt-petre works at Grenelle. In 1796 he became a member of the Institute, in 1800 a councillor of state, in 1801 minister of the interior, and in 1805 grand officer of the Legion of Honour, and a senator. Author of sev. works on chem.

Chapter, originally an assembly of monks or canons, now the body of ecclesiastics, known as canons, attached to a cathedral or collegiate church. They are presided over by a dean, and are considered as the council of the bishop. The term is used in both the Anglican and Rom. Catholic churches.

Chapter-house, building in which the chapter (*q.v.*) of canons of a monastic estab., cathedral, or collegiate church meets for the discussion of its affairs. They are often elaborately designed and ornamented, and usually polygonal, or octagonal, as at Lichfield and York, in shape. Benedictine Cs. are usually square, as at Canterbury, but Westminster has an octagonal C. and Worcester a circular. The C. at Lincoln is a decagon. York C. is remarkable for still preserving the beautiful original stained-glass windows, while the original frescoes are still to be seen on the walls at Westminster. At Ripon the usual central shaft is replaced by two central pillars supporting the

ceiling, and there is an apsidal end. In position the C. usually lies to the W. of the transepts of the church, from which it opens either directly or by a passage. Crypts are occasionally found beneath the floor.



THE NORMAN CHAPTER-HOUSE OF
BRISTOL CATHEDRAL

An engraving of a drawing by R. Garland, 1538

Chapu, Henri Michel Antoine (1833-91), celebrated Fr. sculptor. He was b. at Mée (Seine-et-Marne), and was a pupil of both Pradier and Duret. He became a member of the École des Beaux Arts in Paris in the year 1849 and won the Grand Prix, and in 1855 the medal. His first work shown in the Salon was 'Mercury inventing the Caduceus,' and it is now in the Luxembourg at Paris. His strong point in sculpture was his extremely able portrayal of tenderness and charm in woman. His most typical pieces of work are 'Princess Hélène at the Tomb of the duc d'Orléans,' now at Dreux; and 'Youth' in memory of Henri Regnault. His 'Joan of Arc at Domrémy' in the Luxembourg is not his best work.

Chapultepec, tn. 14 m. from Mexico, with 1200 inhab. where the anc. Aztec kings resided. The residence itself has been replaced by a castle, which serves as a military school. Here the Mexicans were finally defeated by the Amers. in 1847. In consequence Texas, New Mexico, and California were ceded to the U.S.A.

Char, see **CHARR**

Char, or **Charra**, tn. of Kenya, E. Africa. It is situated on the R. Tana, 4 m. from its mouth.

Char-a-banc was originally a large four-wheeled vehicle in the form of a wagonette with benched seats from side to side and facing driver. There was an alley-way in the middle. It was drawn by two or four

horses according to size and used principally for picnic parties. It has in the motor age developed into the motor coach and the use of the older name has fallen into disuse.

Characeæ, order of the green Algae of which the species inhabit fresh and brackish water of pools and slow streams. They emit a nauseous offensive odour, and near Rome they are pestilential. They are interesting on account of the facility with which they exhibit the circulation of their fluids.

Characteristic (of a logarithm), see **LOGARITHMS**.

Charade, kind of riddle, consisting of the subdivision of a complete word, which forms the answer, into its component syllables or letters. A certain amount of information is given of each syllable or letter, and also of the reunited whole, which then has to be guessed. Cs. may be either written or acted. In the latter, which form a favourite drawing-room amusement, the scenes—one for each syllable of the word, and one for the word itself—are arranged to introduce plainly, though not obtrusively, the syllable or word in question. Cs. are usually extemporised, half the company retiring and concocting scenes which they return and act to the remaining half, who attempt to guess the word. Written Cs. for acting may also be bought. In dumb Cs. the acting is entirely in dumb show.

Charadriiformes, plover-like birds, form the eleventh tribe in Gadow's classification, and comprise sev. hundreds of species of various habits. The group is subdivided into the *Limicola*, birds which wade and fly, e.g. the oyster-catcher, the various plovers, sandpiper, and snipe; the *Lari*, which swim and fly, e.g. the gull; the *Pterocles*, which are desert birds, e.g. sand-grouse; the *Columba*, good flyers, e.g. dove; and sometimes a fifth group is added, *Alce*, marine birds, e.g. the auk.

Charms, genus of moths of the owlet-moth family or Noctuidæ, is represented in Britain by sev. species. The larvae feed upon roots, and pupate underground. *C. graminis* is common in Sweden, where the caterpillar frequently proves destructive to the pastures.

Charala, tn. of Colombia, in the dept. of Santander, 120 m. N.E. of Bogotá. Pop. 11,000.

Charcoal, blackish residue consisting of impure carbon, obtained by removing the volatile constituents of animal and vegetable substances. It is a porous solid, burning without flame or smoke, obtained by the imperfect combustion of organic matter. Various kinds are produced from wood, sugar, bone, and coal (giving coke and gas carbons). Wood charcoal results from strongly heating wood. If for fuel, it is best prepared by partial combustion of wood in heaps; for gunpowder the wood is charred in externally heated cylinders to avoid the introduction of grit. Brown C., used in preparing 'cocoa' powder, is prepared at a lower temp. Wood charcoal is used as a fuel, a filter, and an absorbent of gases and aqueous vapours; also, as a non-conductor

of heat, for packing round cold storage-rooms or refrigerators.

Animal charcoal, or bone black, is produced by dry distillation of bones and ivory. It contains mainly calcium and magnesium phosphates, and is often manufactured from residues obtained in glue and gelatin industries. Its decolorizing power was applied in 1812 to the clarification of syrups obtained in sugar refining, but other reagents have now replaced it for this purpose. It is also used as a deodorant and for crayons. *See also* CARBON.

Charcot, Jean Baptiste Etienne Auguste (1867-1936), Fr. doctor and Antarctic explorer, *b.* at Neuilly-sur-Seine, the son of Jean Martin C. He commanded the Fr. Antarctic expedition of 1903-5 and also that of 1908-10. The latter expedition sailed in Aug. 1908 from Havre in a vessel called the *Pourquoi Pas?* It was one of the best fitted out and up-to-date vessels that ever put out on such a quest. The expedition brought back much very valuable information, as the whole affair had been carried through most scientifically. A new coastline in 70° S. was mapped, as also were Graham Land, Adelaide Is., Alexander Land, and Deception Isle. Much hydrographic work was done, such as soundings, surface and deep-sea temps., deep-sea dredging and fishing with tow and vertical nets. The expedition came back to Rouen in June 1910. Dr. C. pub. an account of his explorations in *Le Français au Pôle Sud* in 1905, and *Le Pourquoi Pas? dans l'Antarctique* in 1910 (C. Land in Antarctica is named after him); *Rapports des croisières scientifiques de 1912 à 1914 et de 1914 à 1930*, and *Autour du Pôle Sud* (1912). He died at sea.

Charcot, Jean Martin (1825-93), Fr. physician, *b.* in Paris. He graduated as M.D. of Paris Univ. in 1853, and three years later he became physician of the Central Hospital Bureau. In 1860 he was appointed prof. of pathological anatomy in the medical school of Paris, and in 1862 he began his connection with the Salpêtrière which lasted all his life. He was elected to the Academy of Medicine in 1873, and in 1883 was made a member of the Institute. He was a good linguist and had an excellent knowledge of the literature of other countries as well as his own. He was a great clinical observer and pathologist. He spent much of his time in studying obscure morbid conditions such as hysteria in relation to hypnosis. His work at the Salpêtrière was chiefly in the study of nervous diseases, but besides his labours in the field of nerves he also pub. many able works on the subjects of liver and kidney diseases, gout, etc. His complete works came out in nine vols. between 1886 and 1890. He was extraordinarily successful as a teacher, and his many followers were most enthusiastic in their work. Dr. S. Freud was among his pupils. He d. very suddenly at Morvan while on a holiday.

Chard, municipal bor. and mkt. tn. of Somersetshire, England, situated within a mile of the Devonshire border, on high

ground, between the Bristol and Eng. Channels. It is of great historic interest, being the scene of a victory gained by the parl. forces during the Civil war. Judge Jeffreys held here in 1681 one of his 'bloody assizes.' There are manufs. of linen collars, lace, and iron and brass goods. Pop. 4,500.

Chard, John Rouse Merriott (1847-97), Eng. engineer officer who defended Rorke's Drift successfully with Lt. Bromhead and 110 men against 3,000 Zulus. He thus saved Greytown and Helpmakaar, and made sure the retreat of Chelmsford's forces. This was fought on the night of the Isandhlwana disaster, Jan. 22, 1879.

Chardin, Jean Baptiste Simon (1699-1779), Fr. painter, *b.* in Paris. He was a pupil of Coppel, whom he copied in details of nature. His early work was in still life pictures, and they were often believed to be by Flemish artists. He was the first notable Fr. artist to depict middle-class life, which he did with truth and refinement. As a *genre* painter, his pictures were in sharp contrast to the work of his contemporaries, who always depicted the *fêtes galantes* of their time. Among his best paintings are 'Le Bénédicité,' 'L'Enfant au Toton' ('Child with Teetotum'), 'Le Buffet,' 'Le Jeune Violoniste,' 'La Toilette du Matin,' and 'Les Tours de Carte' ('Card Tricks'). Most of his pictures are in the Louvre, but the National Gallery, London, has one of them; there are others in other Brit. galleries and in Glasgow Univ., and Dublin has his 'Card Tricks.' *See* lives by E. and J. de Goncourt, 1861; E. Pilon, 1909; and G. Wildenstein, 1933.

Chardin, Sir John (1643-1713), E. traveller, *b.* in Paris, the son of a jeweller. During 1661-70 he visited India and Persia, spending some years at Ispahân, where he acquired much useful knowledge, and was employed as a royal agent for the purchase of jewels. After revisiting Paris, he returned to Persia in 1671, remaining there till 1677. In 1681 he settled in London, where he was knighted by Charles II., elected a fellow of the Royal Society, and employed on diplomatic mission. His *Travels in Persia and the East Indies* (3 vols.) appeared 1686-1711.

Chardonnet Silk, *see under* ARTIFICIAL SILK.

Chardzhou, *tn.* in Uzbekistan, in the C. Region of the Turkmén S.S.R., near S. bank of the Amu Daria and 70 m. S.W. of Bokhara on the Trans-Caspian railway. It has trade in raw cotton. Pop. 10,000.

Charente, dept. of France, formed out of the old prov. of Angoumois, with portions of Saintonge, Poitou, Marche, Limousin, and Périgord. Area 2,306 sq. m., divided into the three arrons. of Angoulême, Cognac, and Confolens. Watered by the Charente, Vienne, and Dronne, the last forming the S. boundary. The greater part of the surface is undulating, with a light warm soil resting upon calcareous or chalky rocks. A small dist. in the N.E. is hilly, with numerous lakes, and has a clay soil on a granite or schist foundation. Granite, limestone,

iron, and gypsum are found. There is extensive forest land, and grain, potatoes, vines, beets, hemp, flax, and truffles are grown. Chief manufs.: paper, felt, and woollen and cotton goods. Cap. Angoulême. Pop. 311,000.

Charente-Maritime, dept. of S.W. France, formed out of most of the old provs. of Aunis, and parts of Saintonge, Poitou, and Angoumois, and including the is. of Ré and Oléron. Area 2790 m., divided into the arrons. of La Rochelle, Jonzac, Rochefort-sur-Mer, and Saintes. Watered by the Charente, Boutonne, Sèvre-Niortaise, Touvre, and Gironde. Surface level, with very fertile soil. Grain, vines, potatoes, pulse, hemp, flax, beets, and fruit are grown, and much livestock reared. The chief industries are agriculture, the distillation of Cognac brandy, the working of the salt-marshes on the coast, and the pilchard and oyster fisheries. Cap., La Rochelle. Pop. 116,100.

Charente, River, riv. of France, rising in Haute-Vienne, 14 m. N.W. of Chalus, and flowing W. through Charente and Charente-Maritime into the Atlantic opposite the is. of Oléron. Length 200 m. Tribs., Boutonne on the r. b., and Touvre and Né on the l. b.

Charenton-le-Pont, tn. of Seine, France, at confluence of Seine and Marne, 1 m. S.E. of Paris. Has ports on the Seine and Marne, a celebrated lunatic asylum (actually at St. Maurice), and many country houses. Pop. 21,000.

Chares, Athenian general of fourth century B.C. In 366 he was sent to assist the Philistines against the Arkives, Arcadians, and Thebans; in 361 defeated the democratic party at Corevra; in 358 compelled the execution of the Convention of Athenodorus in Thrace, and in 357 took over the command of the Social war. His successes seem to have been largely due to party influence and corruption.

Chares of Lindus, in Rhodes, Gk. sculptor of about the fourth century B.C., a pupil of Lysippos. He is the traditional designer of the Colossus at Rhodes, one of the seven wonders of the world. This, which was a bronze statue of Apollo, was destroyed by earthquake in 224 B.C. See **Colossus**.

Chares of Mytilene, master of ceremonies at the court of Alexander the Great. He appears to have held sev. military commands, but in this connection there is confusion with Chares the Athenian general. Small portions of his book of anecdotes about Alexander are still extant.

Charette de la Contrie, François Athanase (1763-96), was the leader of the Vendean rebellion against the Fr. Revolution. He was b. at Coulé, near Oudon (Loire-Inférieure). He was made chief of the Lower Vendée in 1793, and as he had many successful encounters with the revolutionists he was ordered to assist the Royalist Army against Nantes (June 1793). C. was then unsuccessful, but he began a harassing guerrilla warfare. An armistice was made between C. and the Convention early in 1795, but it did not last long. After the defeat at Quiberon

(June 27, 1795) Hoche pursued him relentlessly, and defeated him again and again. At last Hoche took him prisoner and had him executed at Nantes on March 26.

Charge, in law, in a wide sense denotes a duty or obligation imposed upon some person in a will, or deed, or contract, or in some transaction collateral thereto. More strictly C. denotes a mortgage, lien, hypothecation, or pledge over a specific thing by virtue of which a creditor may in certain events be entitled to satisfy his claim out of the thing itself or proceeds thereof.

Chargé d'Affaires, diplomatic agent, ranking next below a resident minister, in connection with the ministers for foreign affairs, from the head of which dept. he holds his credentials. He may either act as a representative at a minor court or be empowered to take the place of an ambas. in his absence.

Charging Current: 1. Of an accumulator battery, the current at which electricity should be made to flow into the battery in order to bring it into that chemical condition which makes it a potential source of electrical energy. The C. C. depends on the capacity of the accumulator, and the quantity of electricity put into it is known as the *charge*, being usually measured in ampere-hours. 2. Of a condenser, the rate of flow of electricity into a condenser resulting from the potential differences across its terminals.

Charing Cross, dist. of London, England, at the W. end of the Strand and on the S.E. side of Trafalgar Square, within the city of Westminster. It takes its name from the stone cross which was erected by Edward I. to mark the last resting-place of the coffin of his queen, Eleanor, before her interment in Westminster Abbey. A fine modern cross stands in the courtyard of the former S. Railway station in the Strand. The origin of the name 'Charing' is doubtful, although popular tradition derived it from 'chère-reine' in reference to Edward's 'dear queen.' Another derivation is suggested from 'O.E. *cierring*, "turning, turn" - referring to the bend in the Thames near the place or possibly to a bend of the Roman road that ran near by' (*Concise Oxford Dictionary of English Place-names*).

Charing Cross Bridge Scheme. This is a plan for adding to the amenities of London by giving greater traffic facilities, at the same time improving on the alleged shortcomings of the Londoner of Victorian days in the matter of architectural beauty. The bridge over the Thames at Charing Cross is for railway traffic, with a footway beside the metals. It stands on the site of the old Hungerford suspension bridge; and the red-brick pier in the riv., near the Surrey side, forming part of the old bridge, has been incorporated in the present structure, which is of steel with round steel caissons, or pillars, the whole being painted a dull red. While adequate for the purpose for which it was built, namely to carry the Southern Region line into Charing Cross station, and admirable from the point of view of traffic on the riv.,

affording as it does an uninterrupted view, it has been denounced by the æsthetic-minded as an eyesore. This impression was heightened by the fact that Rennie's Waterloo Bridge (now demolished), the next bridge down-stream, had very considerable architectural merits, although difficult to negotiate by river traffic—a series of canal arches, it was called by Mr. Bernard Shaw. There is also a feeling that the foreshore on the Surrey side of the riv. between Westminster and Waterloo bridges has a drab and shabby appearance unworthy of the capacity of an empire. This is borne in on the

was the finest of its kind in the world. The road it carried was quite level, but it was very narrow, for apart from the footpaths there was little more space than would suffice for the two streams of traffic, north- and south-bound. The subsidence was doubtless caused by the bigger wash made by the passage of larger vessels up-stream than were in use when Rennie built the bridge, for among other craft, colliers, carrying about 2000 tons of coal, now pass up the riv. to Vauxhall and Wandsworth. The subsidence made the question of a new, or repaired, Waterloo Bridge urgent and the Gov. of Mr.



John H.

CHARING CROSS BRIDGE, FROM COUNTY HALL ON THE SURREY SIDE

observer when he regards County Hall and the short embankment in front of it and then contrasts this improvement with the somewhat anct. wharves and the old brewery that neighbour it. Added to these æsthetic considerations are the practical ones that a road bridge at Charing Cross would greatly relieve the congested traffic in the Strand and that the existence of a tube railway running under the Thames connecting Charing Cross with Waterloo has to some extent obviated the necessity to have the terminus of the Southern railway on the Middlesex side of the riv. What finally brought the question to a head was the serious subsidence of two of the central arches of Waterloo Bridge. Of the fourteen road bridges over the Thames in the co. of London, Waterloo Bridge was the oldest standing, for John Rennie's masterpiece was opened in 1817. This bridge had as many as nine arches and it

Baldwin appointed a royal commission presided over by Lord Leo of Farnham to consider the whole question of the Thames bridges in London. This commission produced a report dealing, *inter alia*, with the Charing Cross scheme, and on March 16, 1927, the Gov. announced that it would find 50 to 75 per cent of the money needed for new bridges and river-side improvements in connection with them, being prepared to spend £1,000,000 a year for a number of years. On July 30, 1929, the London County Council and the shareholders of the Southern railway approved the agreement reached between the leaders of these two bodies to build a new bridge from Charing Cross to the Surrey side, the scheme involving the placing of the terminus of the S.E. section of the Southern railway on the site of the Lion brewery. This approval having been given, a Bill was promoted in Parliament in 1930 to obtain the necessary

sanction to proceed with this work. It was, however, rejected by the House of Commons, which was not satisfied with the site of the terminus and the effect it would have on the amenities of the Surrey bank. Two years later further preparation of the scheme lapsed for reasons of economy, the estimated cost being about £12,000,000.

In the elaborate County of London Plan prepared for the London County Council by J. H. Forshaw and Sir Patrick Abercrombie in 1943, the erection of new bridges at Charing Cross and the Temple are regarded, not in the light of an ambitious scheme, but merely as prerequisites of a proper development of the S. bank of the riv. It is suggested in this plan that the proposal for new bridges at Charing Cross and the Temple would be more than compensated for by the removal of three railway bridges and the substitution of tunnels. For the new bridges would be so designed, with large arches and few piers, that riv. traffic was interfered with as little as possible. The suggestions made in this plan envisage the reconstruction at a more convenient level of Charing Cross station and its overhead approaches—and similarly with a number of other stations, including London Bridge and Blackfriars. On the N. bank of the riv. the plan proposes that the riverside stations at Charing Cross, Cannon Street, and Blackfriars might be replaced by underground stations below their present sites and the three connected on an underground system to continue from Charing Cross to Victoria station and thence under the riv. to Battersea. The N. bank loop would be supplemented by a deep-level link from Charing Cross to London Bridge via Waterloo junction. By means of two underground loops it is hoped, by this plan, to dispense with the need for the existing high-level approaches to head-on terminals at Charing Cross and Cannon Street, as well as for the existing high-level stations at London Bridge and Waterloo junction and for their viaduct connections. All stations concerned would be replaced by underground 'through' stations on each loop. See J. H. Forshaw and Patrick Abercrombie, *County of London Plan*, 1943.

Chariot, kind of two-wheeled carriage, used both in peace and war in anct. times by the E. nations, Egyptians, Assyrians, Babylonians, Gks., Romans, anct. Britons, etc. Various forms of Cs. for different purposes are depicted in monuments, etc. The most familiar type is the war C., usually drawn by two horses. That of the Homeric heroes is partly formed of open rail work, the Rom. pattern is rather heavier, and that of E. nations still more solid. Some E. peoples had scythes attached to the wheel-axles of war-Cs. The quadriga, or racing C., was drawn by four horses harnessed abreast, as was also the Rom. *currus triumphalis*, on which generals made triumphant entries into Rome. This was round in shape, and unlike most Cs., closed behind. **Charisius** Aurelius Arcadius, Rom.

jurist of about the fourth century A.D. His works are quoted in the *Digest*, and from internal evidence he is supposed to be the last jurist of the classical period of Rom. jurisprudence. The three books of which portions remain are *Liber singularis de Testibus*; *Liber singularis de Muneribus civilibus*; and *Liber singularis de Officio Præfecti pratorio*.

Charité, La, or La Charité-sur-Loire, tn. of Nièvre, France, 14 m. N.W. of Nevers. Manufs. iron ware and trades in wine. Has magnificent twelfth-century church and the ruins of a priory founded 1052, to which the tn. owes its origin. Pop. 5000.

Charites (Lat. name *Gratiæ*), Graces, were the daughters of Jupiter and the goddesses of beauty and grace. They were three in number, Aglaia (Brilliance), Euphrosyne (Mirth), and Thalia (Bloom), and were generally in attendance on Aphrodite. They presided over physical exercises, dancing, and festivals, and were the patrons of poetry and art, through which they were closely allied to the Muses. They are generally represented as young, beautiful, nude girls, holding each other by the hand.

Charities (Charitable Trusts and Uses, Superstitious Uses). The term charity popularly connotes the relief of poverty. No such restricted meaning attaches to the term C. in law, indeed one judicial decision defines 'charity' as a gift to a general public purpose, which extends as well to the rich as to the poor, but although not really susceptible of any precise definition, a sufficiently accurate conception of its signification is to be inferred from the purposes which the law has interpreted as 'charitable' in the construction of testamentary bequests to charity, or for charitable purposes. In law C. and charitable uses or trusts are interchangeable terms and the decision of the question whether a purpose is or is not charitable depends upon a long line of judicial precedents more or less remotely based upon the enumeration of a varied list of C. in the preamble of a statute passed in the forty-third years of the reign of Elizabeth. The objects of C. therein enumerated comprise the relief of aged, impotent, and poor people; the maintenance of sick and maimed soldiers and mariners; schools of learning and free schools of univs.; the repair of bridges, ports, havens, causeways, churches, sea banks, and highways; the education and preferment of orphans; the relief or maintenance of houses of correction; marriages of poor maids; supportation aid and help of young tradesmen, handicraftsmen and persons decayed; the relief or redemption of prisoners or captives and the aid or ease of any poor inhabs. concerning payment of taxes. A number of these objects savour of medieval ideas, and apart from the fact that the enumeration has never been held to be exhaustive, it is not easy to discern any common defined principle underlying them. In the eye of the law only those trusts are charitable whose object is at least intended to be for the public benefit, whether, if carried out, it would actually benefit the

community or not; e.g. a trust of funds to further the movement for the suppression of vivisection is a valid charitable trust, although both the court and many lay minds might be of the opinion that such suppression was contrary to public interests.

A generally accepted modern definition of C. or charitable trusts is that of Lord Macnaghten in a decision given in 1891, to the effect that such trusts are 'trusts for the relief of poverty, trusts for the advancement of education, trusts for the advancement of religion, and trusts for other purposes beneficial to the community, not falling under any of the preceding heads.' A trust for the benefit of particular individuals named by the donor is not a charitable trust, and would therefore fail if and in so far as it contravened the rule against perpetuities (*q.v.*), a trust or use for charitable purposes being the only class of gift which by the Eng. law is permitted to infringe that rule—the purpose of which is to prevent the tying up of property beyond the power of alienation. Unlike a trust for public purposes, there need be no great degree of certainty as to the objects intended to be benefited by a charitable trust, provided only the donor evinces a general intention of charity. Hence in a case where a testator left a legacy in trust for 'charitable or philanthropic purposes' the court decided that as philanthropic purposes were not necessarily charitable, and the testator had in no way apportioned the fund between the objects indicated by him, the whole trust failed. Assuming the donor manifests a general intention of charity, the mere fact that the particular charitable purpose expressed by him cannot be carried out (*e.g.* where the institution proposed to be benefited is not yet in existence) will not involve the complete failure of the trust; for the court will remedy the difficulty by carrying out the purpose *cy-près*, i.e. as nearly as possible to effectuate the donor's intention. This is done by inviting the charity commissioners to submit a scheme for the approval of the court. According to various legal decisions, founded on the analogy of alienations in mortmain (see MORTMAIN), gifts for superstitious uses or purposes are void. Superstitious uses have been judicially defined as those which are created for the purpose of propagating the rites of a religion not tolerated by the law. The effect of the Toleration Act, combined with present-day public opinion, make it impossible to say that any form of religion is not tolerated by the law, and the meaning of the term superstitious use can seemingly only be inferred from the different purposes which have been declared superstitious, e.g. gifts for saying masses for the dead, or for maintaining a lamp in a church. The various Acts of Parliament removing the religious disabilities of Rom. Catholics and Jews, Unitarians and other dissenters, have resulted in gifts being 'charitable' which would otherwise have been deemed superstitious; but these relieving Acts will not operate

to render valid any trust which is superstitious in the old sense without being charitable. The Scottish law contains no prohibition against donations in perpetuity for a public purpose nor any distinction between charitable trusts or any other public trust. The law in Ireland, which is to be found in the Charitable Donations and Bequests (Ireland) Acts, 1844, 1867, and 1871, allows of bequests for saying masses either generally or to commemorate the named dead. As to the statutory inability of C. to hold lands, and the exceptions thereto by reason of the Mortmain Acts, see under MORTMAIN.

Statutes governing Charities.—The law on C. is of considerable antiquity, but the records would seem to show that in former times charitable benefactions were administered in a casual unsystematic manner. Prohibition against alienation in mortmain dates from feudal times, the earlier statutes being directed against the growing accumulation of land by the religious houses, whereby the mesne lords lost the incidents of tenure. Thus, the famous statute *De Viris Religiosis*, which was passed in the reign of Edward I. and is the precursor of the later mortmain statutes, prohibited the acquisition and retention of land in such manner as to deprive the king and his lords of their feudal dues. A succession of statutes followed, until in course of time what are known as the Mortmain and Charitable Uses Acts were evolved. The first serious attempt to encourage charitable benefactions and to protect the foundations administering C. dates from the statute 43 Eliz. c. 1, repealed by the Mortmain and Charitable Uses Act, 1888. The definition of the term charity, in so far as it is capable of legal definition, is to be found in the Mortmain and Charitable Uses Act, 1888 (section 13), preserving the preamble to the repealed statute of Elizabeth. The statutes governing charity procedure prior to the Charitable Trusts Acts include the Charities Procedure Act, 1812, popularly known as *Romilly's Act*, which is the basis of the jurisdiction of the chancery div. of the high court to deal with charity matters on petition; and this Act may be regarded as the forerunner of the Charitable Trusts Acts. The Charitable Trusts Acts, 1853–1925, form the basis of modern charity administration; the permanent administrative body (estab. by the early fifteenth- to seventeenth-century Acts) being the charity commissioners, who, sitting as a board, exercise a controlling influence over charitable foundations. They have judicial as well as administrative powers. The Mortmain and Charitable Uses Act, 1888, consolidated the law relating to mortmain and the disposition of land for charitable uses. It did not apply, however, to testamentary dispositions (a disastrous omission); hence an amending Act was passed (1891) providing, *inter alia*, for devises of land for charitable uses; but required such land, notwithstanding anything in the will to the contrary, to be sold within a year of

the testator's death or such extended period as might be determined by the court of the commissioners. There are also a number of statutes relating to Rom. Catholic C., war C., etc.

Administration of Trusts for Old People.—In the Nuffield Foundation's *Report of a Survey of Charitable Trusts in Great Britain providing Funds for the Accommodation, Care and Comfort of Old People* (1947), the most comprehensive survey of Cs. since 1816, there is clear evidence that the 'administration of many endowed charities is so confused, and the trust deeds under which many of them are administered so archaic, that the whole picture is one of chaos and of frustration of the spirit in which the charities were originally endowed' (Rowntree Committee report on *Old People*). The Cs. surveyed possess endowments valued at £75,000,000, including an estimated £10,000,000 for purely parochial Cs., and they hold land and buildings worth £7,500,000 for the use of old people. Their normal ann. income is about £5,000,000 and their expenditure well over £4,000,000, nearly all of which goes on old people, including £1,200,000 devoted to accommodation in almshouses and homes, and to in-pensions and similar benefits. But the bulk of these Cs. were founded to meet wants for which other provision is now made and they have not been sufficiently adapted to serve the needs which still remain to be satisfied. Some of the Cs. are centuries old; nearly all began before the introduction of public pensions and social services in the present century. A lot of their expenditure on pensions and grants to old people serves to-day merely to reduce the obligations of the assistance board. Taxpayers instead of old people are thus being subsidised, and many almshouse trusts which need their money to maintain or improve their premises are still obliged to relieve the board in this way. Almshouses are also frequently hampered by obsolete rules of admittance, just as thousands of small parochial Cs. are ineffectively frittering away their resources on small grants or occasional distributions of bread or coal. There would certainly seem to be need for an extensive revision and rationalisation of the Cs. in this field. In the case of the mass of parochial Cs. the Nuffield Foundation concluded that systematic local amalgamations should be promoted throughout the country and that their consolidated resources might well be applied to the support and modernisation of local almshouses. Consult *Tudor's Law of Charitable Trusts*, 1854, 1900; Boucher-Chilcott's *Administration of Charities*, 1912.

Chariton, Gk. prose writer of probably about the fifth century A.D. A native of Aphrodisias in Caria. His one extant work, *The Loves of Chareas and Callirhoe*, is an erotic romance, written in a pleasant and simple style. The best text, with Lat. version and a commentary, is that of D'Orville (1750).

Chariton, city of Lucas co., Iowa, U.S.A. Pop. 5700.

Charity Commissioners. The C. C. were appointed by the Charitable Trusts Act, 1853, for the better administration of charitable trusts (see *CHARITIES*). They have jurisdiction over charities by virtue of a number of Acts, such as the Mortmain and Charitable Uses Acts, 1882-92, and such recent Acts as the War Charities Act, 1916, and the Blind Persons Act, 1920. For the purpose of the C. C., a charity or charitable trust includes every institution in England or Wales endowed for charitable purposes, subject to express exemptions in the Charitable Trusts Amendment Act, 1855. These exemptions comprise the univs. of Oxford, Cambridge, London, and Durham, Eton and Winchester Colleges, any building registered as a place of meeting for religious worship, the Brit. Museum, funds under the control of the commissioners of Queen Anne's Bounty, any friendly or benefit society, and generally, any society for religious or charitable purposes wholly maintained by voluntary contributions. Exemptions under later Acts include parochial and prison charities, charity allotments, and the property of dissolved municipal corporations. The Act of 1853, together with the various amending Acts, gives the C. C. power to appoint new trustees of charities, but only with the consent of a majority of the trustees where the ann. income of the charitable trust exceeds £50, and to advise trustees of charities in the administration of trust funds. Trustees who act on the advice of the C. C. are indemnified by statute against all liability. The C. C. are also empowered to give permission to trustees of charities to sell, mortgage, or grant leases of land held subject to a charitable trust. An important power of the C. C. is that by which they can adapt the charitable intentions of a donor to the requirements of modern civilisation in cases where the literal execution of the donor's wishes has become either inexpedient or impracticable. (See as to *cy-près* under *CHARITIES*.) The court will not interfere with a scheme settled by the C. C. except in a case where the commissioners have either exceeded their jurisdiction or formulated a scheme containing something wrong in principle or law. The administration of a charity by the C. C. may result in a considerable measure of economy, as their orders have the same effect as a judgment order or decree of the chancery div. of the high court, and, moreover, they are invested with adequate powers of demanding accounts, instituting inquiries into the condition and management of charities, supervising the expenditure of income, and controlling the disposition of the corpus or capital of the trust funds by the trustees. By the passing of the Board (now Ministry) of Education Act, 1899, the powers of the C. C. in regard to educational charities were transferred to the Board of Education. Under the A. of 1853 an ann. report must be laid before Parliament, setting forth all schemes finally approved by the C. C. The Act of 1853 makes provision for the

appointment of four C. C., two at least of whom must be barristers-at-law of not less than twelve years' standing, and two of whom are salaried. No paid commissioner, secretary, or assistant commissioner may sit in the House of Commons during the tenure of his office. The aggregate amount of stocks and investments held by the official trustees of charitable funds is over £70,000,000 (1930). See works mentioned under CHARITIES, and ann. reports of the commissioners.

Charity, Orders of. Religious orders of men and women devoted to the service of the poor or afflicted. The earliest sisters of charity in the Rom. Catholic Church were founded by S. Vincent de Paul in Paris in 1633. Sisterhoods of charity were formed in the Anglican communities in the nineteenth century. See also SISTERHOODS.

Charity Organisation Society. The general object of this society is to give a definite aim to, and to direct into the most effectual channels, the large amount of benevolent forces at work in England, and particularly in London. It is a combination of charitable persons, each of whom, with the advantages of co-operation, and a definite plan of work, ought to be better able to fulfil his individual duties. It is not the desire of the society to supersede local charitable agencies, but to be representative of all such within their area—to afford means of mutual assistance and a place of meeting common to all who are engaged in charitable work. The society consists of a federation of dist. committees within the London area, whose general principles of action are determined by a central council formed by representatives of dist. committees, with certain additional members. Any person being a member of a dist. committee, or being an ann. subscriber of not less than one guinea or a donor of not less than ten guineas to the funds of the council, or of any dist. committee, is a member of the society. The dist. committees consist as far as possible of ministers of religion, local administrators, and representatives of all the prin. local charities. The council consists not only of representatives of the dist. committees, but also of additional members selected by the council, additional members of corresponding societies for the organisation of charity specially selected by the council, and honorary members. The president and vice-president of the society are honorary members of the council. The offices of the council are at Denison House, Westminster, S.W. The council's duties may be said to be educative, reformative, and co-operative. They include the propagation of sound principles in regard to the administration of charity; the invitation of co-operation on the part of all societies and individuals engaged in charitable work; the convention of special committees to report on questions connected with the administration of charity and the reform of charitable administration generally; and the suppression by prosecution or other-

wise of impostors on the charity of the benevolent. The dist. committees apply the principles of the council's methods by training workers among the poor, by bringing agencies and charitably disposed persons into touch with each other, and by promoting local schemes for the aid of the poor and the spread of provident habits. The work of the C. O. S., on its educative and reformative side, combined with similar work on the part of other charitable societies, has no doubt played its part in the introduction of legislation in the shape of social reformative measures. The institution of employment exchanges, the provision of medical and other benefits under the Insurance Acts and the Old Age Pension and Widows and Orphans Pension Acts, have to a certain extent effectuated the work of the C. O. S. in the direction of recommending aged and infirm persons for pensions, and promoting improvements in the administration of medical relief and the alleviation and prevention of unemployment.

As the C. O. S. was founded as long ago as 1869, in the heyday of Victorian prosperity, it is of interest to consider how the economic stresses of the twentieth century, especially those since the First World War, have affected its attitude, and, more important, the attitude of the public to the society. Although working in close touch with official agencies, the C. O. S. is, of course, a voluntary society, and in this has lain part of its strength. It was inevitable, therefore, that the society should be forced on the defensive, as it was, when the new era of gov. activity in all manner of social relief was entered upon, and the tendency was enhanced in the period following the Second World War when the re-organisation of social services had become a major political preoccupation. As the society's policy is that of 'appropriate treatment of individual cases' with its apparatus of 'case papers' and 'case-work,' gov. action on the other hand of necessity tends towards 'legal endowment of categories,' i.e. legislative action, on a large scale, leaving useful investigatory work to the C. O. S. with its 'personal touch' (see annual report for 1929).

Charivari. Fr. term of uncertain origin, used for a wild uproar caused by the banging of pans and kettles, mingled with hissing, groaning, and shouting, expressive of disapproval of the people against whom it is directed. It was originally a regular wedding-custom in France in the Middle Ages, but later it was only used at unpopular weddings, particularly for widows or widowers who remarried too soon. The custom and name were introduced into Fr. America where it became corrupted into 'shivaree.' The violence and coarse nature of the Ca. were strongly opposed by the Church and in the seventeenth century the Council of Tours forbade them entirely under pain of excommunication. The custom still continues in some rural dists., and is similar to the notorious 'Haberfeld-treiben' of the Bavarian peasants. In modern times the name Ca., from its

suggesting satire and derision, has been taken as the title of various satirical papers, the *Chartari* (Paris) 1832, and as a subtitle for the Eng. *Punch*.

Charkhari, stato in the Bundelkhand agency of Central India. The tn. of C. is 40 m. W. of Banda. Pop. 12,000.

Charlatan (It. *ciarlatano*, from *ciarlare*, to chatter), introduced in the sixteenth century as the name for a group of the *jongleurs* who amused the people by their 'patter' and buffooneries. The name quickly became associated with cheap-jacks and quack doctors, hence it has come to be used of any impostor.

Charlemagne (Carolus Magnus), or Charles I. (c. A.D. 742-814), son of Pépin le Bref, king of the Franks, and emperor of the West. On his father's death, 768, he became king of Austrasia and Neustria, and on the death of his brother Carloman, 771, added his dominions, becoming supreme ruler of the whole empire. From 761 he had accompanied Pépin on various military expeditions. He was a great statesman, legislator, and soldier, and founder of the 'Holy Roman Empire.' His success was largely due to his championship of Christianity. His war against the Saxons lasted from 772 to 804, some of the chief incidents being the storming of Freil. and destruction of the Irminsul, the slay-field at Paderborn (777), and submission of the Saxon leader, Wittekind. The result was the complete subjugation and Christianisation of the Saxons. C. divorced his first wife, daughter of Desiderius of Lombardy, and married a Ger. princess, Hildegard. In 773 Pope Adrian I. appealed to C. to crush Desiderius, who was threatening Rome and supporting the descendants of Carloman. By 774 the conqueror had made himself also king of Lombardy. In 778 he fought against the Arabs in Spain. On his return he met with a reverse at Roncesvalles, where Roland and other famous paladins were slain by the Saracens. Then he waged border wars against Lombards, Bavarians, Avars, Bretons, and others (c. 788-800). In 800 Pope Leo III. crowned him at Rome as emperor of the West, with the title 'Caesar Augustus.' In 808-810 he defeated the Danes, driving them back behind the Elbe. To protect his kingdom he erected marks or margraves in the border dists. In 813 he associated his son, Louis le Débonnaire, with him in the gov., Louis was the only son who survived him, and became his successor. His empire at its height stretched between the Elbe and Rhine, reaching eastward to Hungary, and S. to Calabria. C. was a patron of music and learning, welcoming such scholars as Alcuin, Alcuin, and Warnefried at his court. His descendants were known as Carolingians, forming the second dynasty of Frankish kings. See T. Hodgkin, *Charles the Great*, 1894; H. W. C. Davis, *Charles I. Emperor of the West*, 1900; G. P. Baker, *Charlemagne and the United States of Europe*, 1933; D. Woodruff, *Charlemagne*, 1934.

Charlemont, fort in Ardennes, France, standing on a height of 700 ft. by the R.

Meuse, near the Belgian frontier, opposite Givet.

Charleroi. 1. tn. of Hainaut, Belgium, on R. Sambre, 30 m. S. of Brussels. It is the centre of a great coal-producing region, and stands at the junction of numerous railways which distribute the coal all over Belgium. There are large iron foundries, machine shops, factories of cutlery, glass, mails, electrical industries, fire-bricks, etc. The C. canal connects it with Brussels. Formerly a fortress. At the battle of C. which took place Aug. 22-23, 1914, the Fifth Fr. Army was overwhelmed by the Gers and forced to retreat. C. was taken and 160 houses were burnt. C. fell to the 3rd Armoured Div. of Hodges' Amer. First Army after a rapid advance of 40 m., Sept. 2-3 (1944) which carried them across Belgian border. Pop. 25,800. 2. A bor. in Pennsylvania, U.S.A., with glass works and coal mines. Pop. 10,700.

Charles I. (Karl Franz Josef) (1887-1922), last emperor of Austria-Hungary, b. Aug. 17, at Persenegg, Lower Austria; eldest son of Archduke Otto and Princess Maria Josepha of Saxony. Otto was younger brother of Archduke Franz Ferdinand, who had renounced claim to the throne. Otto dying in 1906, C. became heir-presumptive to Francis Joseph. In 1911 he married Princess Zita of Bourbon-Parma. He succeeded to the throne Nov. 21, 1916, in the midst of war; and the changes he made in military dispositions did not turn out well. In April 1918 it became known that he had conveyed, through his brother-in-law, Prince Sixte of Bourbon-Parma, to the Fr. president a promise to support Fr. claims to Alsace-Lorraine. C. disavowed his action, but the full text was pub. (see also AUSTRIA, HUNGARY). On Nov. 11, 1918, C. renounced control of affairs of Austria, and, temporarily, of those of Hungary. Under Brit. protection, he left Austria for Switzerland in March 1919, and next month the Austrian Parliament formally deposed him. In March 1921 he suddenly appeared at Budapest; but there was no welcome—he became ill and returned to Switzerland, promising to come again. Swiss authorities thenceforth watched him closely; but he managed to leave Switzerland by aeroplane in Oct., and flew to the Burgenland. His small army was defeated near Budapest, and he was taken by a Brit. warship to Madeira, where he d. April 1.

Charles I., king of the Franks, see CHARLEMAGNE.

Charles II. the Bald (823-77), Rom. emperor and king of the W. Franks, son of Louis the Pious. The div. of the empire on the death of Louis the Pious was the cause of the outbreak of war between the sons of that king. C. and Louis the German forced the Emperor Lothaire to make peace at Verdun, 843. On the death of Louis II. C. received the crown of the empire, but Louis the German immediately invaded his kingdom and ravaged it.

Charles II. the Fat (Emperor Charles III.) (832-88), king of the W. Franks

and emperor of the Romans. He was the youngest son of Louis the Ger., and received from his father the kingdom of Swabia. On the death of his two elder brothers he inherited the crown of the Rom. empire (882). His attempt to drive out the Saracens from Italy failed entirely, and he was only able to obtain terms with the Norsemen—who penetrated at this time as far as Paris, which they besieged—by heavy payments. The divorce which he obtained from his wife led to a conspiracy of the nobility which deposed him (887).

Charles IV. (1316–78), emperor of the Holy Rom. Empire and king of Bohemia. He was educated in France and married the sister of the Fr. king, Philip VI. He was chosen as the Ger. candidate for the empire in opposition to Louis IV., who had quarrelled with the papacy. He took part with his father in the battle of Crécy, and succeeded to the kingdom of his father after that battle. He succeeded Louis IV. as emperor, and was supported by the pope, to whom he had granted practically the sovereignty of Italy. He entered Italy only to be crowned, and although the Romans implored him to redress their grievances he returned to Bohemia. He imprisoned Rienzi, who appealed to him on behalf of the Romans, and took no notice of the pleadings of Petrarch.

Charles V. (1500–58), emperor of the Holy Rom. Empire and king of Spain (as Charles I.). He was the son of Philip of Burgundy and Joanna, the daughter of Ferdinand and Isabella, and was born in Feb. Six years later his father died, and C. succeeded to the Netherlands and the Franche Comté. In 1516 Ferdinand died, and C. was recognised as the sovereign of Castile and Aragón in conjunction with his mother in 1517. In the same year he succeeded to the Hapsburg possessions on the death of his paternal grandfather, Maximilian, and two years later, in spite of considerable opposition on the part of France and the papacy, he was elected emperor. C.'s dominions were now widespread and various; he ruled Spain, and the Americas, parts of Italy (Naples, Sicily, and Sardinia), together with the Hapsburg possessions, which were themselves a scattered collection of different races. He was hampered in Spain by the Cortes, in Germany by the Diets, and there was in almost every different part of his empire a different system of gov. The difficulties of the beginning of his reign can be shortly stated as coming (1) from Lutheranism, a force which he found himself opposed to right at the beginning of his reign; (2) from the opposition of France, whose armies he had to fight in the first few years of his reign in order to keep possession of his It. dominions; (3) from the continually increasing Turkish power in Europe, which was made more formidable by its alliance with the piratical races of the N. of Africa. These difficulties were only solved transitorily by C., and were constantly recurring.

His religious policy became manifest from his first appearance at the Diet of Worms—the restoration of Germany to

the Catholic faith, and in this object he never faltered. The Diet condemned Luther and Lutheranism; the constant attempts of C. to restore Germany to Rome accounts to a very great extent for his failure in that country. The early part of his reign may be regarded as a constant struggle with Francis I., a struggle which ended only with the defeat and capture of Francis at Pavia. In 1526 Francis, consenting to the terms of C., was released, and in the following year the Holy League was formed by his quondam allies and his hereditary enemy, Francis. In the same year an army of the emperor gathered from almost every part of his wide empire, attacked, captured, and sacked Rome, making the pope a prisoner. C. immediately disclaimed all responsibility for the act, but made use of the advantages which it gave him. In 1529 Francis and C. made peace at Cambrai. During the events of the earlier part of his reign C. had been resident in Spain. The Spaniards had not been altogether pleased by the election of C. to the empire, since it had relegated them to the background. They had therefore put numerous difficulties in his way, and had in many ways prevented him from raising a sufficiency of supplies for his wars. In 1529 C. was crowned emperor of the Romans, and king of Lombardy, and in the following year was held the Diet of Augsburg, which reiterated the decisions of the Diet of Worms and brought about the formation of the 'Protestant' League of Schmalkald. But the threatened persecution of the Protestants was stayed by political events. Whilst C. was emperor of Germany he would always be dependent upon the goodwill of his Protestant subjects for aid against the natural enemies of the empire. This time the difficulty arose in the E. The Turks were always a thorn in the side of the empire, and they now threatened C., but the danger was avoided without war, and C. returned to Spain. In 1535 he stormed and captured the pirate stronghold of Tunis, and in the following year Francis again declared war. The war did not go fortunately for C., and in 1538 the intervention of the papacy brought about a ten years' truce. In 1539 C. commenced his policy of crushing the power of the prov. Cortes of Spain, which from this time gradually sank into disrepute, and in the same year he cruelly crushed the rising in the Netherlands, depriving the tn. of Ghent of all its privileges. In 1541 he again attempted to attack Tunis, but was unsuccessful, attributing his lack of success to an 'act of God.' War again broke out with Francis, and this time that Christian monarch did not disdain alliance with the Turks, and Europe was horrified when the Turkish fleet anchored and wintered in Toulon. That most Christian monarch, Henry VIII., sprang to arms and assisted C. in his invasion of France, which forced on the treaty of Crépy (1544), when the Fr. claims on Italy were again repudiated. C. was now free to carry out the policy upon which he had set his heart, namely the restoration of Germany to the

Catholic Church. Previously he had been compelled by the exigencies of political events to keep on good terms with the Protestants. The Protestants appealed to arms, but the greater force of C. defeated them and made their leaders prisoners. The Interim of Augsburg followed, but failed to please either the Protestants or the Catholics. Finally the schemes of Maurice of Saxony succeeded, and the Protestants were able to demand terms which they had never expected. The legal recognition of Protestantism followed in the peace of Augsburg of 1555, although this was far from being a final settlement. C.'s greatest and best loved scheme had failed. In addition to this, long and earnestly he had attempted to bring about the succession of his son Philip to the empire. This scheme was again defeated, and the double blow, together with the state of his health, led to his abdication in 1555. In that year he resigned the Netherlands, the most dearly loved of all his possessions, to his son Philip, in the following year he resigned the Sp. possessions, and in 1558 he formally resigned the empire, although his brother Ferdinand had been emperor in all but name since 1555. He spent the remaining three years of his life in retirement at Yuste in the valley of Estremadura, where he died in Sept. 1558. Personally C. was popular. In his policy he was at least sincere, but the inheritance which he left to Philip bore dire results. His religious persecutions were the extreme of sincere conviction, but were unfortunate. The Thirty Years war was in itself the logical sequence of the treaty of Augsburg. See F. A. M. Mignet, *Charles-Quint*, 1854; E. Armstrong, *The Emperor Charles V.*, 1902; R. B. Merriman, *The Rise of the Spanish Empire*, 1925; D. B. Wyndham Lewis, *Charles V.*, 1932.

Charles VI. (1685-1740), emperor of the Holy Rom. empire, second son of the Emperor Leopold I., was born at Vienna. When the extinction of the Sp. Hapsburg house became apparent, he was put forward as the Austrian claimant to the Sp. inheritance. By the second Partition Treaty he was to be recognised as the king of Spain, but on the demise of Charles II. of Spain, Louis XIV. practically tore up the Partition Treaties. He was, however, proclaimed by the allies as king of Spain, and went to Spain in the early stages of the war. He remained there until 1711, meeting with very little success, although he was supported by the Catalans, and even entered Madrid. But he was never popular with the Sp. people and in 1711 he practically forfeited his claim when he became emperor. The idea underlying the war of the Sp. Succession was to preserve the balance of power, and C. was informed that an attempt to revive the dominions of Charles V. would not be permitted by the powers. He ultimately abandoned Spain and turned his attention to securing the succession to the Austrian throne for his daughter, Maria Theresa. He foresaw the struggle which must arise on his death without male heirs, and he sacrificed much in order to put the

Pragmatic Sanction recognised by the powers. During his reign the war with the Turks was brought to a successful issue by the treaty of Passarowitz, but before the end of his reign he had lost almost all that he gained by that treaty. He d. in 1740, the last male of his house.

Charles I. (1600-19), king of Great Britain and Ireland, the second son of James I. and his wife Anne of Denmark,



CHARLES I.

The statue at Charing Cross, London

was b. at Dunfermline in Nov. 1600. He was created duke of Albany on his birth, duke of York in 1605, and four years after the death of his elder brother he received the title of Prince of Wales (1616). At an early age he took a lively interest in political matters, and after 1620 fell under the influence of Buckingham. In 1623 he went to Spain in disguise with Buckingham in an attempt to win the infanta's love by this romantic adventure. The pair reached Madrid, but the Spaniards were too astute to allow their flank to be thus turned. James hoped that, if his son married the infanta, the Spaniards would be willing to interfere on behalf of his son-in-law, Frederick of the Palatinate. This the Spaniards had no intention of doing, but thought that James ought to show some favour to the Eng. Catholics

though James could not do so without the consent of Parliament. They still held to these terms, and as Buckingham proved himself a poor negotiator, the treaty with Spain was broken off and C. returned home, loudly denouncing the ill faith of the Spaniards and calling for war, and in 1624 Parliament voted supplies for war with Spain. In the same year C. entered into a marriage contract with Henrietta Maria of France, and although both the king and the prince declared that no tolerance would be granted to the Catholics by the marriage treaty, this promise was not adhered to. He immediately called Parliament together and promised no remission of the penal laws against the Catholics; but already his duplicity was known, and Parliament granted but small supplies and insisted upon the redress of grievances. In 1625, the year in which he became king, he had married Henrietta Maria, who was allowed to set up a Catholic chapel at court and to hold Catholic services. In the following year the Catholic followers of Henrietta Maria were sent back to France. In the meantime C. had again come into collision with his second Parliament, and although he tried to menace it, victory really rested with Parliament. He was already involved in difficulties, and to these difficulties was added a war with France. In 1628 his third Parliament met and passed the Petition of Right, which forbade taxation without consent of Parliament, and arbitrary and illegal imprisonment. C. was forced to consent to this. In 1627 the expedition to the Isle of Ré had failed, and in 1629 a similar expedition met with a similar fate and Buckingham was assassinated at Portsmouth. In the same year C. dissolved his third Parliament, but not until they had passed a resolution condemning innovations in religion and the collection of tonnage and poundage. From 1629 to 1640 C. ruled without a Parliament. The eleven years' tyranny involved C. in many attempts to raise money for his immediate needs. In almost every way he roused the antipathy of his subjects; he levied tonnage and poundage, he sequestered estates, and this policy led to the loss of the support of London; he estab. a military tyranny in Ireland under Wentworth (Strafford). In 1634 he made his first levy of ship money, and in the following year he made another levy, this time on the inland tns. as well. In 1638 came the great Hampden case, when C.'s right to levy ship money was acknowledged by the courts. His religious policy also roused the ill-feeling of his subjects. The High Church was favoured, the Catholics tolerated, and the Puritans persecuted. His Scottish policy precipitated matters. In 1633 he had visited Scotland for his Scottish coronation; in 1638 Laud's liturgy was introduced, in 1637 this led to a riot in St. Giles's Cathedral and to the signing of the Covenant. A general assembly was called, but when this assembly proposed to discuss episcopacy it was dissolved by the high commissioner.

The assembly, however, refused to dissolve and abolished episcopacy. Having done this, it prepared to meet the king in arms. The king, finding himself unable to raise sufficient forces, on the advice of Strafford called Parliament. The Short Parliament met in 1640; it proposed to discuss grievances and was immediately dissolved. He again went N. to attack the Scots, and again found it impossible to meet force with force. The result was that peace was made with the Scots practically on their own terms, and C. turned his attention to England, where in Nov. 1640 he called the Long Parliament. The result of the eleven years' tyranny had been hopeless failure.

The Parliament which met in 1640 was in no mood for trifling. The imprisoned members of his third Parliament had bitter personal grievances, and the whole country was in favour of reform. The execution of Strafford was immediately decided on by the Long Parliament, and although C. had sworn that not one hair of his head should be touched, he was ultimately forced to consent to the execution of his great minister. C., in fact, treacherously sacrificed his loyal servitor to fears for the queen's safety. Parliament forced concession after concession out of C. Parliament was only to be dissolved with its own consent, the Star Chamber and High Commission Court were abolished, and ship money was declared illegal. C. was, however, still intriguing and still trying to find some way in which he could escape from the clutches of Parliament. In 1641 he was forced to listen to the Grand Remonstrance, and early in Jan. 1642 he made the disastrous attempt to imprison the five members. This ill-starred attempt was motivated by the knowledge of an impending impeachment of the queen herself. He rode back to Whitehall after his failure amidst cries of 'Privilege of Parliament,' and now began to prepare for war. Hull refused to admit C. in April 1642, and in Aug. C. raised his standard at Nottingham. The early stages of the war went on the whole in his favour, but after the advent of Cromwell's Ironsides victory after victory fell to the Parliamentarians. The two great disasters with which the king met were Marston Moor and Naseby, where the New Model Army crushed the Royalists utterly. On May 5, 1646, the king surrendered to the Scots at Newark, and was taken to Newcastle. He was four months in captivity at Holmby House, near Northampton, whence he sent his answer to the Newcastle propositions concerning the militia, Presbyterian, and other matters. But in the midst of the negotiation with the Parliament he was seized on June 3, 1647, by Cornet Joyce under military instructions and, soon afterwards, when the army occupied London, C. was placed at Hampton Court. He was some three months there, but escaped on Nov. 11, 1647, to Carisbrooke Castle, and from there he made fresh offers concerning Presbyterianism and the control of the militia. But soon afterwards he refused

his assent to various Bills on the militia and parl. adjournments, with the result that both Houses of Parliament now resolved to hold no further communication with him. Meanwhile C. had taken the fatal step which was to involve him in complete disaster: at the end of Dec. 1647 he entered into the 'engagement' with the Scots which resulted in the second Civil war and the determination of the ultra-Puritans to bring him to execution. In Jan. 1649, Parliament, having been cleared of all possible supporters of the king by Pride's purge, resolved to bring the king before a high court of justice. On the 19th the trial began. The king refused to recognise the jurisdiction of the court, and on the whole behaved with magnificent dignity and self-possession. His execution, however, was resolved upon, he was brought up to hear the sentence passed upon him on the 27th, and was not allowed to make any answer to the charges. He was executed before Whitehall Palace on Jan. 30, his last word being 'Remember!' Consult the *Maseses Papers*, which include much contemporary evidence of the relations between C. and Parliament, including an account by Denzil (Lord) Holles, *Calendar of State Papers, 1625-49*, 1328-97; histories of the period by Edward Hyde, earl of Clarendon; J. R. Green; H. Stallum; F. Guizot; and L. von Ranke; and, especially, S. R. Gardiner, *History of England, 1603-1642*, 1863-82, 1883-84, and *History of the Great Civil War, 1886-91*, 1895. See also I. D'Israeli, *Commentaries on the Life and Reign of Charles I.*, 1828-31; E. Bruce (ed.) *Letters of Charles the First to Queen Henrietta Maria*, 1856; E. B. Chancellor, *Life of Charles I., 1600-25*, 1886; J. G. Muddiman, *Trial of Charles I.*, 1928; and the elaborate lives by Sir J. Skelton, 1898; A. Foa, 1904; F. M. G. Ilgham, 1932; E. Wingfield-Stratford, *Charles, King of England, 1600-1637*; *King Charles and King Pym, 1637-1643*; and *King Charles the Martyr, 1643-1649*, 1949.

Charles II. (1630-85), king of Great Britain and Ireland, was b. on May 29 at St. James's Palace. During the Civil war he was with his father during the early events, but after the defeat at Naseby he went to Falmouth, and from thence to Scilly. From Scilly he went to join the queen in Paris, and he remained there for two years. On the execution of his father in 1649, he was immediately proclaimed king in Scotland. He projected an invasion of Ireland, but in 1650, having signed the Solemn League and Covenant, he embarked for Scotland. On landing in Scotland he found himself in the power of the covenanting party, and was made to take a number of oaths which he had no intention of keeping. On Jan. 1, 1651, he was crowned at Scone, and on Sept. 3 his forces, having penetrated England as far as Worcester, were defeated by Cromwell. C., who distinguished himself by his bravery during the battle, fled, and after wandering in disguise throughout the country for six

weeks, now concealed in an oak-tree at Boscombe, now riding disguised as a serving-man, and anon hiding in Stonehenge, with a price set on his head, he at length escaped in safety to France. In 1654, relations between England and France having altered, he was forced to quit France, and spent the rest of his years of exile in wandering from one country to another. He tried to induce various of the great powers to help in his restoration, but failed. The death of Cromwell in Sept. 1658 changed affairs in England considerably, and from that time his ultimate return was only a matter of time, and was eventually brought about through the influence of George Monck, duke of Albemarle, who conducted



CHARLES II

N.P.G.

The painting by J. M. Wright

the negotiations with the exile. On Monck's advice C. in April 1660 issued the Declaration of Breda (which was mainly the work of Clarendon) after a Royalist rising had been put down in the previous year, and early in May he was declared king at Westminster. Towards the end of the month he set forth from Breda and landed at Dover, where he was received with enthusiasm everywhere, the nation dreading a military despotism above all things. But the general rejoicings were soon to cease. C. had returned from his travels with two ideas firmly implanted in his mind: he would not again go on his travels, and he would have his own way in his own affairs. Innate selfishness is the dominant note in the whole of the policy of C.'s reign. The first seven years of his reign were passed under the domination of Clarendon. The Restoration settlement was not followed by any very great persecution, a number of the

regicides were executed, but on the whole the Restoration was tolerant. The Cavalier Parliament, however, restored the Church in England, and in a similar manner bishops were restored to Scotland. The early years of the reign were disgraced by the Dutch war, during which the Dutch even sailed up the Thames and destroyed the shipping there. In 1667 Clarendon was dismissed, and Buckingham and Arlington became the chief ministers; these, together with Lauderdale, Ashley, and Clifford, formed in 1672 the famous Cabal. It was during this period that C. entered into those close relations with France which made him practically the pensioner of the Fr. king, gained him incidentally a fresh mistress in Louise de Kéroualle, and cost England her natural foreign policy, which was obviously to attack the aggrandisement of France. No act of C.'s reign was more unpopular than the sale (1662) of Dunkirk. In 1670 were signed the two secret treaties of Dover, the first of which pledged C. to the overthrow of Protestantism and gave him a pension of £200,000 per annum. The Cabal ministry met with considerable opposition in the country, and many of the acts of the king and his ministers at this time were unpopular in the extreme. The 'stop of the exchequer' ruined a number of people, and the second Declaration of Indulgence was declared illegal by Parliament, and the Test Act was passed. Danby now became the chief minister, but even he was carried away by the policy of his royal master, and another treaty with France was signed, a treaty which gave France the control of our foreign policy. By secret treaties in 1676-78 and by intriguing with the opposition Louis XIV. achieved his purpose—to cut England off from continental politics. In 1677, however, William of Orange married Mary, the eldest daughter of James, duke of York. Danby, whose share in the treaty with France was disclosed by Louis XIV. in revenge for his having brought about this marriage, only escaped impeachment by the dissolution of Parliament. In the meantime the country had been agitated by the Popish Plot, a scheme put forward by Shaftesbury and the ultra-Protestant party. C. met it in the best possible way. He recognised that it had received general credence in the country, and he allowed it to continue, knowing full well that in the course of time the falseness of it would be discovered. The Protestant party now pressed for the exclusion of James, duke of York, from the crown. C., whilst reiterating that he would never consent to the Exclusion Bill, sent James out of the country for a short time, and declared his pleasure at the attempts to convert him to Protestantism. The exclusionists, however, went too far in asserting the claim of James, duke of Monmouth, C.'s illegitimate son by Lucy Walters. In the Parliament of Oxford, by insisting on the recognition of the duke of Monmouth, they caused the dissolution of Parliament, and C. appealed

to the nation at large, which supported him against the extremists. For the rest of the reign C. was supreme, he continued his intrigues with France, and did all he could to help on the aggrandisement of that country. His popularity was immense, and was increased by the discovery of the Rye House Plot, for which Sidney and Russell paid the extreme penalty, and he gradually began to attempt the restoration of the Catholic religion. His movements in this direction were barely apparent when he d. He declared himself a Rom. Catholic on his deathbed. He left no children by his wife, but a numerous progeny by his many mistresses. By Nell Gwynn (1650-87) C. was father of Charles Beaulieu, duke of St. Albans (1670-1726), Louise de Kéroualle (1619-1734), who was made duchess of Portsmouth (1672) and duchesse d'Aubigny in 1681, was mother by C. of Charles Lennox, duke of Richmond (1672-1723). Other mistresses were 'la belle Stewart' (duchess of Richmond) and the duchess of Mazarin. See the histories mentioned under Charles I.; the diaries of Pepys and Evelyn; A. Hamilton, *Mémoires de la vie du comte du Grammont*, 1713 (trans. A. Boyer, 1714); *Calendar of State Papers*, 1649-67, 1860; D. Masson, *The Life of John Milton*, 1859-74; W. H. Ainsworth, *Old St. Paul's*, 1841; P. Cunningham, *The Story of Nell Gwynn*, 1852, 1893, S. E. Hoskins, *Charles II. in the Channel Islands*, 1854; J. F. Molloy, *Royalty Restored*, 1885; E. Scott, *King in Exile*, 1905; R. Crawford, *The Last Days of Charles II.*, 1909; H. N. Williams, *Royal Sultanas*, 1915. Lives by W. Harris, 1766; O. Airy, 1901; A. Bryant, 1931. See also H. C. Foxcroft's *Life of Halifax*, which contains Halifax's 'Character of Charles II.' 1898.

Charles III. the Simple (879-929), king of France, the posthumous son of Louis the Stammerer. He was not called to the throne on the death of Charles the Fat, because of his extreme youth. In 893, however, he was recognised by some of the nobility as king, and was crowned at Rheims. He forced the *de facto* king, Odo, to cede him Neustria, and ultimately, on the death of Odo, he became king of all France. His reign is of great importance owing to the fact that by the treaty of Saint-Clair-sur-Epte he ceded Normandy to the Norse leader Rollo, and thus established the future duchy of Normandy. The growth of the power of the king, however, roused the jealousy of the nobles, who made a conspiracy against him and placed Robert on the throne. The Robertians were defeated, but C. himself was by treachery captured and imprisoned. He d. at Péronne.

Charles IV. the Fair (1294-1328), last of the direct Capetian line, succeeded his brother, Philip V. He tried to continue the policy of augmenting the power of the central authority at the expense of baronial power, but in order to obtain money he resorted to dubious methods, such, for example, as the confiscation of the property of the Lombard merchants.

He arranged with his sister Isabella the plot which finally overthrew Edward II.

Charles V. (1337-80), king of France, sometimes styled C. the Wise. He was the son of King John II., and narrowly escaped the fate of his father at the battle of Poitiers. During the imprisonment of John in England he acted as ruler of the country. The beginning of the Hundred Years war with England had brought many difficulties to the Fr. monarchy, and C. was called upon to face these. The States-General when it met had demanded reforms which would have given them great powers, and would have made the king practically a constitutional monarch. The merchant and bourgeois classes had seized their opportunity to compel the ruler to make reforms, and in 1358 the Jacquerie added to the difficulties of the Crown. Politically C.'s great struggle was with the king of Navarre (Charles the Bad), whom he ultimately managed to overcome. The treaty of Brétigny brought with it the return of John, who, however, was unable to raise his ransom, and returned to England, where he d. in 1364. C. was now able with the aid of Bertrand du Guesclin to put down the most formidable of his foes and to get rid of a number of the free companies that were ravaging the country, and order was at last restored. War was now renewed with the Eng., and C. was successful in winning it, after which, until by 1380 only a few ins. remained in Eng. hands. In 1378 he made a premature attempt to annex the duchy of Brittany to the Fr. Crown, but his attempt brought in its train a national rising. Before any settlement was made C. d. C. was no soldier, and he owed his successes largely to his well-chosen advisers and administrators. He was a versatile student, and collected a large library of works on astrology, law, and philosophy, at the Louvre, which eventually formed the nucleus of the *Bibliothèque Royale*. Letters of C. are in J. J. Champollion-Figeac's *Lettres de rois et de reines*, vol. II. (1839). See Froissart, *Chronicles*; Benoist, *Policy of Charles V.*, 1874; R. Delachanal, *Histoire de Charles V.*, 1908.

Charles VI. (1368-1422), son of Charles V. and the first of the Fr. princes to bear the title of the Dauphin from birth. He succeeded to the throne at the age of twelve, and during his minority France was governed by the dukes of Berry and Anjou. The excesses of the regents brought with them rebellion in the chief ins. of both N. and S. France. The N. rebels were at first successful in winning for themselves terms, but those of the S. were ruthlessly crushed. The Eng. gave some aid to the rebels, and C. prepared a fleet for the invasion of England. His forces amounted, according to Froissart, to 20,000 men-at-arms, 20,000 cross-bowmen, partly Genoese, and 20,000 'stout varlets.' A fleet almost innumerable, 1287 vessels according to some, was collected on the coast of Flanders; and an enormous wooden bulwark was constructed capable of sheltering, it was said, the whole army from the dreaded archery

of England; it could be taken to pieces and replaced at pleasure. But various delays, whether from contrary winds or other causes, prevented the sailing of the fleet, or a tempest so far shattered it as to frustrate its object. In 1388 C. asserted his authority by driving from power the royal dukes and appointing ministers of his own, who, because of their humble origin, were called the *marmousets*. In 1392, however, C., whose constitution had been undermined by excesses, had his first fit of madness, and this was followed by others of such frequent occurrence as to show that it would be unlikely that C. would be able to rule personally. The royal dukes immediately regained their power in France, and the struggle commenced between the Burgundians and the Orleansists. Externally, during the latter years of the century, affairs were quiet. Peace had been restored with England, but this again was upset by the deposition of Richard II. (C.'s son-in-law) and the accession of Henry IV. The struggle between the Burgundians and Orleansists was now pronounced, and matters were brought to a head by the murder of Orleans in 1407. The Burgundians for the time held the upper hand, and in league with the Parisians forced the king to do their will. In 1413 the Orleansists entered Paris and drove the Burgundians into the arms of England, with whom they concluded an alliance. Henry V. put forward the claim to the Fr. crown and invaded France. In 1415 Agincourt was fought, and in 1418 Paris was captured by the Burgundians. In the following year John the Fearless was assassinated, and the Burgundians definitely became the allies of the Eng. In 1420 the treaty of Troyes, followed by the marriage of Henry V. to the daughter of C. took place, and Henry became practically master of France. See Froissart's *Chronicles*; *Lettres de rois*, vol. II. containing correspondence of Charles V. and Charles VI. in *Lettres de rois et de reines*, printed by J. J. Champollion-Figeac, 1839, and E. Funck-Brentano *Le Moyen Age*, 1922.

Charles VII. (1403-61), king of France, the fifth son of Charles VI. became lieutenant-general of the kingdom in 1417. His power and authority, however, sank after the murder of John the Fearless in 1419, and by the treaty of Troyes he was passed over in the succession to the crown. He retired to Mehun, near Bourges, and remained there for some time. On his father's death he was recognised as king of France by the S. provs., but he gradually lost all hold on the N., and the victories of the Eng. during the early part of his reign lost him still more power. The central provs. of France were involved in internal civil struggles, and C. seemed to have no hope of success when the 'Maid of France' came to his rescue and led him to success after success. Orleans was captured, and he was crowned at Rheims, but even then the ingratitude of the court party gave Jeanne d'Arc a prisoner to the hands of the Eng. Later in his reign C. recognised

the services of the 'Maid of France.' After 1435 affairs in France assumed a brighter state, since the duke of Burgundy joined forces with the Fr. in driving out the Eng. The Eng. were gradually driven out of their Fr. possessions until by 1455 they retained only Calais. In the meantime C. had had difficulties to face at home, and had managed to restore order both amongst the nobility and the people. Most of the king's councillors were drawn from the bourgeoisie, and most of C.'s ministers served him well; for this reason the title of Charles the Well Served



Hanslaengl

CHARLES IX. OF FRANCE

From the painting by François Clouet

is often applied to him. During his reign the power of the central authority was greatly increased and by the end of his reign France had once more begun to settle down to days of peace and prosperity. The hist. of the reign of C. VII. has been written by two modern writers, Vallet de Virville, *Histoire de Charles VII. et de son époque* (1862-65), and G. du Fresne de Beaucourt, *Histoire de Charles VII.* (1881-91). Jean Chartier's *Histoire de Charles VII.* was re-edited in 1858-59 by de Virville.

Charles VIII. (1470-98), king of France, the only son of Louis XI. He succeeded his father, and although he was declared capable of ruling he left the gov. of the country in the hands of his sister, Anne of Beaujeu. He married in 1491 the duchess of Brittany, thus uniting the last independent duchy in France to the monarchy. In 1492 he took up the reins of gov. for himself. Imbued

with wide and romantic projects, he decided to attempt to obtain the kingdom of Naples, to reconquer the E. empire, and to become its emperor. To obtain this desire he sacrificed everything; he entered Naples in 1495, but was unable to proceed any further with his plan since a coalition of the powers was formed against him. He was forced to return to France, and here, whilst preparing for a second expedition, he died.

Charles IX. (1550-74), king of France, the third son of Henry II. and Catherine de' Medici. He succeeded to the throne at the age of ten, and naturally the chief power still remained in the hands of the queen mother. He was a youth of extreme weakness, and had very queer tastes. He was passionately devoted to the chase, but his excesses undermined his constitution. He married in 1570 Elizabeth of Austria. On the appearance of Coligny at the Fr. court, he showed great friendliness, but his weakness and his fanaticism were so cleverly played on by the Catholic party that in 1572 was perpetrated the massacre of St. Bartholomew's Day. After this event C. aged rapidly, and at the time of his death he appeared to be an old man worn out by fever and nightmare. See S. Desjardins, *Charles IX.*, 1873; L. Battifol, *Le Siècle de la Renaissance* (1909; trans. 1916), and L. Roumier, *Catholiques et Huguenots à la cour de Charles IX.*, 1924.

Charles X. (1757-1836), king of France, the son of the Dauphin, the son of Louis XV., and hence a brother of Louis XVI. b. at Versailles. His youth had been passed in the wildest dissipations, and he had made himself and his party exceedingly unpopular in France. He became the leader of the ultra-Royalists on the outbreak of the Fr. Revolution, and in 1789 he left France to become the leader of the Émigrés. He visited many of the courts of Europe, attempting to gain help for the Royalist party. In 1795 he landed in France to put himself at the head of the rising of La Vendée, but his courage failed him, and he left the Royalists of the W., unsupported, to be crushed by the ferocity of Hoche. He lived for the rest of his period of exile in Holyrood Palace, and later at Hartwell. In 1814 he returned to France, and during the reign of his brother Louis XVIII. he was at the head of the party of ultra-Royalists and was successful in gaining the day for the party of reaction. On his accession in 1824 he speedily became popular, but his popularity was not increased by the obvious efforts which he made to restore 'Royalism' in France on the basis of the divine right of kings. His reactionary measures soon made him exceedingly unpopular, and in 1825 he was openly insulted in the streets. He had no desire to become a constitutional monarch, and although he was compelled to get rid of the unpopular minister Villèle he still showed no signs of giving up the Royalist pretensions. The compromise ministry which he set up failed to please him, and he dismissed it. In 1830, the elections having gone against

him and finding violent opposition in the chamber of Deputies, he suspended the constitution. The result was the outbreak of a revolution which C. at first did not treat seriously. But he retired from Paris, and, when the seriousness of the state of affairs was evident, he abdicated in favour of his grandson, Louis Philippe, duke of Orleans, however, was chosen king, and C. retired again to England. He died at G. Ritz, where he had retired for his health. See A. de Lamartine, *Histoire de la Restauration*, 1851-52; P. Vedrenne, *Vie de Charles X.*, 1879; J. de Saint-Armand, *La Cour de Charles X.*, 1892; J. M. S. Allison, *Thiers and the French Monarchy*, 1926; J. Lucas-Dubreton, *Le Comte d'Artois, Charles X.*, 1927.

Charles II. (1661-1700), king of Spain, son of the old age of Philip VI. He was from infancy weak, deformed, and diseased, but his birth was received with acclamation by the Spaniards, who dreaded the settlement of the succession question. For years he was not allowed to walk, and his education, because of his weakness, was neglected. But it quickly became apparent that the king would never rule, and the whole of his reign was taken up with struggles between the Austrian and Fr. parties at court. Each of these scored a triumph by arranging a marriage for the king. The Fr. party married him to a Fr. princess, and on her death he was married to an Austrian princess. It was obvious throughout the reign that on the death of C. the question of succession would be disputed. The Fr. party continually drummed into the ears of the king the fact that only the power of France could save the Sp. Empire from dismemberment, whilst C. himself could barely be persuaded to assimilate this fact owing to his extreme pride in the house of Hapsburg. Finally, on his deathbed, he was practically forced to sign a will leaving the Sp. dominions to Philip of Anjou, grandson of Louis XIV.

Charles III. (1716-88), king of Spain, the eldest son of Philip V of Spain by his marriage to Elizabeth Farnese of Parma. He was duke of Parma by right of his mother, and spent his early youth in Italy. In 1734 he became king of the Two Sicilies, and these he mastered by sheer force of arms, although he was not a great soldier, nor had he any special liking for arms. He early showed great hostility towards Great Britain, a fact which influenced his foreign policy at a later date, and which was probably due to the fact that at the beginning of the war of the Austrian Succession he had been forced to remain neutral under threat of bombardment by the Eng. fleet. On the death of Ferdinand VI. of Spain, he succeeded to the throne. His foreign policy was not noted for its enlightenment. He signed the family compact with France, and took part in the later phases of the Seven Years war against England somewhat disastrously. He again joined the Fr. in 1779 in their attacks upon England during the Amer. War of Independence. But his internal policy is a great contrast

to his foreign policy. Whilst king of the Two Sicilies he had shown his desire to act as an enlightened and benevolent despot, now he proceeded to carry out that policy still further. He forced the Spaniards to adopt sanitary reforms. He recognised that the power of the Church had become too great, and he curbed it. He destroyed the Society of Jesus in Spain, and reduced the number of monastic buildings. In spite of this somewhat drastic policy he always remained a true son of the Church. Roads and canals were constructed, and altogether the period may be regarded as one of great prosperity for Spain. C. died just on the eve of the Fr. Revolution. See J. Addison, *Charles the Third of Spain*, 1900; F. Bousseau, *Règne de Charles III. d'Espagne*, 1759-88, 1907.

Charles IV. (1748-1819), king of Spain, the second son of Charles III. He was noted during his youth for his extreme strength, being a man of fine physical build. He succeeded his father in 1788, but devoted his time to the chase, leaving the gov. of the country to be administered by the queen and her lover, Godoy. He was terrified by the excesses of the Fr. Revolution, and attempted by a policy of extreme reaction to prevent the growth of a 'reforming' party in Spain. He was a man of great credulity, and it is most probable that he never understood the relations of Godoy and his queen. In fact, he always had great faith in his minister, and even went so far in 1808 as to abdicate to save him. He took refuge in France, where he abdicated in favour of Napoleon; he was a strong believer in the theory of divine right, and probably saw nothing wrong in his action in betraying his people. He died at Rome.

Charles VII., king of Sweden during the middle of the twelfth century. Helped to organise the Christian Church in that country and created the archbishopric of Upsala, 1164.

Charles VIII. (d. 1470), elected king of Sweden in 1449. His name was originally Karl Knutsson Benda. He was forced to retire before Christopher of Bavaria in 1441, and after the death of the latter prince was restored, but had again on two occasions to seek safety in flight. After his death the three kingdoms of Scandinavia were again united.

Charles IX. (1550-1611), king of Sweden, third and youngest son of Gustavus Vasa, and is known principally by his stern Calvinism and his struggles in order to obtain the recognition of Sweden as a Protestant nation. In 1568 he was the leader of the rebellion against Eric III., and he was involved in struggles with John III. during the greater part of that king's reign. When Sigismund, a Catholic, and already king of Poland, succeeded to the Swedish throne in 1592, C. came forward as the champion of Protestantism. He was appointed regent in 1595, and became king in 1600, when Sigismund was deposed. He did not, however, assume the title until 1604, and was not actually crowned until 1607. His foreign

policy, which is the most important aspect of his reign, involved him in wars with Russia and Denmark, which were not successful. His importance is due to the fact that he prepared the way for his great son, Gustavus Adolphus, by his fervent Protestant policy.

Charles X. (1622-60), king of Sweden, and nephew of Gustavus Adolphus. A great warrior king, he took part in the later campaign of the Thirty Years war, but was for a short time forced to remain inactive by the treaty of Westphalia (1648). He was the recognised heir to the Swedish throne, to which he succeeded on the abdication of Queen Christina. In 1655 he determined upon war with Poland, and called the Riksdag to grant him supplies. He gathered together a great army and navy and attacked the Poles. Warsaw was easily won, and after a long siege Cracow fell also, and Poland appeared to be conquered, but the Poles were stirred to the depth of their national feeling by these events, and forced the Swedes to retire from the siege of Czenstochowa, which had held out for over ten weeks. This success roused the feelings of the Poles to a very high degree, and the Polish army became again active. C., who desired the conquest of Brandenburg, was by his unfortunate position forced to buy the support of the elector at the price of Prussian independence, and in the following year the Danes declared war against him. This helped rather than hindered him since he was able to give up the Polish campaign on the same justification and concentrate against Denmark. He attacked from the S., but his most astounding feat was the crossing of the Little and Great Belts with his army over the ice. The effect of his unique movement was to crush the Danes who immediately opened negotiations for peace (1658) and agreed to the cession of large tracts of ter. C. however, again without warning attacked the Danes in the midst of these negotiations, and it was only with considerable difficulty that he could be persuaded to reopen negotiations with them. In 1660, when he was meditating an attack upon Norway, and had crossed to Sweden to persuade the Riksdag to grant him further supplies, he died, worn out probably with the strenuous life he had led. See M. J. J. Velbull, *Sveriges Historia: Storhedstida*, 1611-1718, 1877-81; E. Hauman, *War on the North and Peace of Oliva*, 1893; G. Jones, *Diplomatic Relations between Cromwell and Charles X.*, 1897; J. Stefansson, *Denmark and Sweden*, 1916.

Charles XI. (1655-97), king of Sweden, succeeded to the throne at the age of four, being the only son of Charles X. His education, both general and particular, was shamefully neglected by the regents, and C. was practically illiterate when he was called upon to rule the state and to make the final struggle against Denmark. The whole court was corrupt and degraded, yet C. showed great courage and skill in tackling the difficulties of the situation. He commanded his armies

in person, and spent much time and thought in preparing for the national struggle. He defeated the Danes at Fyllebro in 1672, and in the same year he defeated Christian V. of Denmark in the great battle at Lund. The battle was hardly contested, and although the losses of the Swedes were great, still they gained the victory and practically annihilated the forces of Denmark. In 1678 he again defeated the Danes at the battle of Malmö, and in the following years was forced to consent to a peace dictated by Louis XIV. The rest of his reign was devoted to the estab. of Sweden upon a sound basis, and to the rectification of her financial position. Practically every side of the administration was overhauled, financial matters were looked into, commerce encouraged, and church gov. and education reformed. C. died in 1697, leaving behind him a reputation which places him high in rank amongst the kings of Sweden.

Charles XII. (1682-1718), king of Sweden, the only surviving son of Charles XI. He was given an extraordinarily careful training in every respect when young. At an early age he showed considerable natural ability. He was a good rider, a good marksman, and in mathematics and languages he excelled. He was also carefully trained in matters of administration, and at an early age was interested in all the duties of his station. He succeeded his father in 1697, and was given the full sovereignty at once. He was generally popular at the beginning of his reign, although there were indications that he intended to rule according to his own ideas. He was a hard worker, and also showed far more humanity than was customary at that time in one of such high rank. The great northern war of 1699 forced C. into the field. He resolved to attack his nearest enemy first—Denmark. He succeeded, with the co-operation of Sir George Rooke's Anglo-Dutch squadron, in defeating the Danes and wringing from the Dan. king a promise to abstain from further hostilities. He then marched against the Russians who were besieging Narva, and after a week of forced marches succeeded in defeating the besieging force with but small loss to himself. He now turned to pursue the foe whom he regarded with the greatest bitterness, Augustus of Saxony, king of Poland. He captured Warsaw and marched against Cracow, defeating the Poles and Saxons at Klissow. He ravaged the ter. he passed through, spoiled the ins. and harried the inhabs. In 1703 C. won the battle of Pultusk, and later another battle at Plevitz. He deposed the Saxon Augustus, and set up a candidate of his own for the throne of Poland, a candidate who was crowned in 1705. He came into W. Europe just at the crisis of the war of the Sp. Succession, but he had no designs on W. Europe—he desired only the ruin of his natural enemies. In Sept. 1707 he forced Augustus to sign a treaty by which he resigned his claims to the Polish crown and his hostility to Sweden. He now

marched against Russia, defeated them at Holowczyn, and as the Russians fell back followed slowly towards Moscow. Realising that he could not reach Moscow, he now marched southward to join the hetman of the Cossacks, Mazepa. Peter had already destroyed Mazepa's conspiracy, and when the hetman joined C. it was as a fugitive. The winter of 1708 was the most severe Europe had known for 100 years; the sufferings of the Swedes were unimaginable; food failed them, and later the weather became so severe that they could not possibly keep themselves warm. 'The king was at his best at this time, cheering and encouraging' his men. Finally, when the frost broke and the Russians were attacked, the Swedes were practically annihilated, and C. with the remnant of his army took refuge in Turkey. He had great influence in Turkey, where he remained during 1709-14, and caused the Turks to declare war on Russia no less than three times. He finally, however, became so troublesome that after a desperate fight he was taken prisoner at Bender, and finally quitted Turkish ter. and arrived in Stralsund in Nov. 1711. C. immediately raised an army which was strong enough to prevent his being attacked by his enemies, and in 1717 he opened hostilities with Norway. He now formed an ambitious plan involving the surrender of the Swedish Baltic provs., as a *quid pro quo* for terms with Russia; the conquest of Norway; the invasion of Jutland and the substitution of himself for the Stuarts on the throne; his coadjutors being the Jacobites and Cardinal Alberoni. But in the following year, whilst again leading an expedition to Norway, he was shot in the trenches whilst besieging Fredriksten. C. was an able, sagacious, and brave king, but determined to the pitch of obtuseness; while his admirable physique enabled him to share extreme privations with his soldiers. The best life is Voltaire's *Histoire de Charles XII.*, 1731. See also sketches by N. Bam, 1896, and O. Brownie, 1899, and Franklin B. Scott, *Bernadotte and the Fall of Napoleon*, 1935.

Charles XIII. (1748-1818), king of Sweden and Norway, the second son of King Frederick Adolphus, b. at Stockholm. He distinguished himself as an admiral in the Russo-Swedish war, and later became regent of the country. He practically dropped out of state affairs after 1796 until 1809, when he was elected king in place of Gustavus IV., who was deposed. In 1810 Bernadotte (Charles XIV., *q.v.*) was elected crown prince and practically took all power out of the hands of the king, who had by this time become decrepit. In 1814 he became the first king of a united Norway and Sweden, and in 1818 he died, having for ten years been king only in name.

Charles XIV. (1763-1844), king of Norway and Sweden; known also as Jean-Baptist Jules Bernadotte; the son of a lawyer at Pau. He was b. at Pau and entered the Fr. service in 1870, and showed considerable ability in his

profession. On the outbreak of the Revolution he received speedy promotion. He was present at the battle of Fleurus and took part in the campaigns in Germany. In 1797 he took reinforcements to Napoleon in Italy, and in the following year he became ambas. in Vienna. In the same year by his marriage to Désirée Clary he became the brother-in-law of Joseph Bonaparte. He did not take an active part in the *coup d'état* by which Napoleon became First Consul, but he was given in 1801 the command of the army in La Vendée. In 1801, when the empire was declared, he was made a marshal of France, and was also appointed to the governorship of the prov. of Hanover. He took part in the campaigns of Ulm and Austerlitz, and was later made governor of the Hanse tns. For his conduct at Austerlitz he was named in 1805 prince of Pontecorvo. After the battle of Jena he pursued the Prussians to Halle and Gen. Blücher to Lübeck, driving him into surrender. After the battle of Wagram he returned to Paris, having incurred the displeasure of Napoleon by issuing an order which congratulated the Saxons on the courage which they had displayed at Wagram. In 1810 he was appointed to command in the Netherlands. In the same year he was offered the crown of Sweden, because he had considerable popularity there and also because the Swedes desired a strong military ruler, and in the same year was elected crown prince. In Nov. he went to Sweden, where he was adopted by the king, Charles XIII., under the name of Charles John. He almost immediately became exceedingly popular and never really lost his popularity, although some of his views were displeasing to the majority of his subjects. He took part in the later Ger. campaign against Napoleon, and in 1818 he succeeded his adopted father Charles XIII. with the title of C. XIV. His policy from the beginning had been to bring about a union with Norway, and in this he was ultimately successful. His reign on the whole was one of development and peace, and he proved himself an enlightened monarch. See Sir D. P. Barton, *Bernadotte and Napoleon*, 1921; *The Amazing Career of Bernadotte*, 1929.

Charles IV. (1826-72), king of Sweden and Norway. He was the eldest son of Oscar I., and became regent in 1857. He was an exceedingly popular and enlightened king, and during his reign a number of great reforms were made. The laws of the church and the criminal laws underwent considerable reform at this time, and the King also gave his support to the laws which reformed the constitution. He was himself a man of great gifts and had considerable ability. He was a firm supporter of the policy of a strong Scandinavia.

Charles I. (1226-85), king of Naples and Sicily, count of Anjou, and seventh son of Louis VIII. of France. He was b. before the accession of his brother, Louis IX., and was later, on the decease of another brother, given the countries

of Anjou and Maine. In 1246 he married the heiress of the co. of Provence, and after some difficulty succeeded in establishing his authority over his new possessions. He accompanied St. Louis on his first crusade, and was with him when he was defeated and captured, he himself sharing the same fate. Ransomed and released before the king, he returned to France to intrigue with the countess of Flanders against the emperor. In 1257 he captured the important tn. of Marseilles and began to make his influence felt in Piedmont. His great opportunity came when the pope decided to break down the power of the Hohenstaufen in Italy. He was offered the crown of Naples and Sicily, for which he was to pay a yearly tribute to the pope, and which also he would have to win from their allegiance to Manfred, the natural son of Frederick II. He finally accepted the papal offer, and dispatched an expedition to Italy in 1264. In the following year he was crowned king of the Two Sicilies, and a year later he defeated and killed Manfred at Benevento. In 1268 a battle was fought at Tagliacozzo with Conradin, the last descendant of Frederick II., which resulted in the defeat of the supporters of the Hohenstaufen and the capture and execution of Conradin. He was recognised as one of the most powerful monarchs in Europe, and his power was the greater owing to his influence over the papacy. In 1272 he took part in the second and ill-fated crusade of Louis IX., after whose death he returned to Italy. In 1282 occurred the massacre and expulsion known as the Sicilian Vespers, inspired by the cruelty and misrule of the Fr. C. determined to avenge this disaster, but after two defeats, finally had to give up all hope of regaining Sicily. He was preparing another attempt from Naples when he died.

Charles VII. (1697-1745), emperor of Germany, elector of Bavaria, the son of the elector of Bavaria. Since Bavaria took the side of France in the war of the Sp. Succession, C.'s early youth was spent in Vienna, where he was taken by the Austrians. The electorate, however, was restored at the end of the year, and C. took part in the campaign of Austria against the Turks. He succeeded to the electorate in 1726, and his reign was taken up (in spite of having recognised the Pragmatic Sanction) in plotting to obtain the imperial crown on the death of Charles VI., uncle of his wife Maria Amalia. The Bavarian house had some claim to the imperial throne. In 1740 he claimed the imperial crown and was put forward as the puppet of the anti-Austrian faction. He was crowned in 1742, but his sovereignty was merely nominal. His hereditary dominions were overrun, he was twice restored to his cap., but he died, worn out by his many illnesses and troubles.

Charles I. (1889-1914), king of Rumania. Prince Karl Eitel, second son of Prince Karl Anton of Hohenzollern-Sigmaringen, the Rom. Catholic branch of the Hohenzollerns, was b. at Sigmaringen. Served

in the Prussian Army; and, on the de-thronement of Alexander John, was elected prince of Rumania (then under Turkish suzerainty), April 1866. He was energetic in developing the country; but in 1871, when the Fr. sympathies of many of his subjects, together with the failure of a Jewish speculator to whom he had entrusted railway schemes, made the prince unpopular, he offered to abdicate. The ability of a Conservative statesman, Lascar Catargi, aided over this unfortunate period. Prince C. took the field as an ally of Russia in 1877, and on May 21 the independence of Rumania was proclaimed. On May 22, 1881, C. was crowned king at Bucharest, with a steel crown made from a Turkish gun. He married Princess Elizabeth of Wied—'Carmen Sylva', the poetess and musician—in 1869. On the death of their only child, the succession was settled on a nephew, Prince Ferdinand. The opening of the First World War, wherein Rumania's interests were against the Central Powers with which the king was linked, caused much friction between him and his ministry—terminating only with his death at Pelesch, Oct. 10.

Charles (Carol) II. (b. 1893), king of Rumania; b. Oct. 16, at the castle of Pelesch (Sinaja); son of King Ferdinand (q.v.), and Marie, daughter of the duke of Edinburgh. Toward the end of the First World War, he married, at Odessa, a Moldavian lady named Zizi Lămbrișco—or Lambrino—and they had a son. In 1919 he renounced his claim to the succession, since he had no taste for kingship and his wife was not recognised as princess; but his parents persuaded him to give up the lady, the marriage was annulled as illegal for want of banus, and C. was sent on a mission to Japan. On his return, he married, at Athens, March 10, 1921, Helen, daughter of King Constantine of Greece; by whom he had issue the Prince Mihai (Michael), b. 1921. After attending the funeral of the queen-dowager of England, Nov. 1925, instead of going home he went to Paris and thence to Milan—where he publicly renounced the succession, Dec. 28, 1925. Renunciation was accepted by his father, and made legally effective. C. went back to Paris, Feb. 24, 1926, accompanied by a Mme. Lupescu. In Paris, in March, Mme. Lambrino claimed heavy damages for the annulment of her marriage. C. took the surname of Caraiman; the infant Prince Michael succeeded his grandfather, July 20, 1927; and Princess Helen obtained a divorce from C., June 21, 1928. By that time he again changed his mind about kingship, and had been expelled from England (May 16, 1928) for intriguing against the Rumanian Gov. He resided in Brussels for a while. On June 5, 1930, he left Paris by aeroplane, and next day he descended at Bucharest, a new ministry was formed, and the regency resigned. On Sunday, June 8, Carol II. was proclaimed, while his deposed son was given the titles of crown prince and prince of Alba Julia. After the outbreak of the

Second World War the Iron Guard began an agitation for C.'s abdication, and, following riots, C., on Sept. 6, 1940, signed a proclamation announcing his decision to resign in favour of his son Michael. His efforts to stem the pro-Axis current in Rumania were unavailing and he left the country. He settled in S. America, where he married Mme Lupescu in 1947.

Charles Albert (1798-1849), king of Sardinia, the son of Prince Charles of Savoy-Carignano. The early death of his father led to the neglect of his education. During the early years of his life Piedmont was overrun by the Fr., but after 1814 the king of Sardinia restored his court to Turin. C. A., who was in the direct line of succession, was regarded with horror by the Royalists on account of his supposed revolutionary ideas. He was, however, recognised as heir-apparent. In 1821 a revolution forced the king (Charles Felix) to abdicate, and C. A. became regent. He granted a constitution which was repudiated by the king, and he himself became distrusted by both Royalists and Liberals. He was still, however, regarded as the heir-apparent, although Metternich strongly favoured the selection of an Austrian prince. In 1823 he fought in Spain, and in 1831 he succeeded Charles Felix. He attempted to reform the finances and administration of Piedmont, but was only partially successful. In 1848 he granted a Liberal constitution, and in the same year declared war on Austria, and went to the help of the Milanese. At first successful, he was finally beaten, and on his entrance into Milan was received badly. He, however, continued the struggle, but failing to obtain terms after the battle of La Bicocca, he abdicated in favour of his son and retired to a monastery, where a few months later he died. See N. Bianchi, *Storia della diplomazia europea in Italia*, 1865; and *Scritti e lettere di Carlo Alberto*, 1879; L. Cappelletti, *Storia di Carlo Alberto*, 1891; C. de Beauregard, *La Jeunesse du roi Charles Albert*, 1899; and A. di Saluzzo, *Carlo Alberto della restaurazione all'avvenimento al trono*, 1926.

Charles Augustus (Karl August) (1757-1828), grand duke of Saxe-Weimar. His father d. before he was one year of age, and the duchy was administered by his mother. The prince received a very careful education, and spent the early part of his youth in travelling. In 1775 he was declared of age, and began actually to rule. His reign is noted for the enlightenment of the policy which he adopted. He introduced the poet Goethe to the court and to his counsels, and although he was a hard drinker and a good sportsman, this was not allowed to interfere with the serious policy that he had adopted. His people were not to be governed despotically nor yet benevolently, but were to be so educated that they would be capable of governing themselves. This policy speedily made the univ. of Jena the most important in Europe. During the early part of his reign he was driven by the Austrian policy into the arms of Prussia, with whom he concluded an

alliance. The revolutionary wars found him fighting in the ranks of the Prussian Army, and he fought against Napoleon until the Jena campaign forced him to join the confederation of the Rhine. Again in 1812 he was in arms against Napoleon, and continued so until the end. In 1815 he took part in the Congress of Vienna and pleaded hard for the recognition of the rights of the people. His home policy made Saxe-Weimar one of the few free countries in Europe, but his enlightened policy drew down on him the censures of the reactionary ministers of other countries, especially of Metternich. He granted a liberal constitution to his people, and was one of the few princes who were not driven by the excesses of the revolution to a policy of reaction. See F. X. Wegele, *Karl August, Grossherzog von Sachsen-Weimar*, 1850; and lives by W. Bode, 1913, and H. von Egloffstein, 1913, 1915.

Charles Edward, see STUART, CHARLES EDWARD.

Charles Eugene (Karl Eugen) (1728-93), duke of Württemberg. Succeeded in 1737, but did not come of age until 1744. He had good ability, but he wasted his talents in extravagant and vicious living. He fought against Prussia during the Seven Years war, a course that was decidedly unpopular in the duchy. His methods of financial and political administration roused much resentment amongst his people, and although he was forced to promise reforms, he continued his former practices. His period of rule was continually disturbed by internal troubles.

Charles Louis (1771-1847), archduke of Austria, and duke of Teschen, the third son of the Emperor Leopold II.; became one of the most distinguished generals of the Napoleonic period. He began his career as a soldier during the revolutionary wars, being at that time stationed in the Netherlands. He commanded a brigade at Jemappes, and during the subsequent campaigns proved himself a general of such ability that in 1796, after serving for a year with the army of the Rhine, he was given the chief command of that army. His campaign of 1796 was one of the most brilliant of the whole of the war. He defeated Jourdan twice during the year, and finally drove the Fr. across the Rhine. Although in the following year he found Napoleon more than a match for him, he again showed his consummate skill as a general in the manner in which he conducted the retreat of his armies. The campaign of 1799 found him again in command of the Austrian armies of the Rhine and again opposed to his old enemy Jourdan. He defeated the Fr. general twice during the year, and even tried conclusions successfully with Masséna, and once more he forced the Fr. to retire over the Rhine. After this campaign his health drove him for a short time into retirement in Bohemia, but he again commanded the Austrian armies during the short campaign which preceded Hohenlinden, and after that battle concluded an armistice with the Fr. In 1805 he took up the command of the armies in Italy, but

events in Germany soon drew him from Italy, where he had fought the battle of Caldiero and defeated Masséna. The peace which followed the disasters of Ulm and Austerlitz was used by the archduke to reorganise the Austrian forces. In 1809 he again became commander-in-chief of the Austrian Army, which he had not yet been able completely to reform. The struggles of the Austrians against Napoleon were not altogether unsuccessful, and the victory of Aspern had certainly a good moral effect on the rest of Europe. Aspern was followed by Wagram, where the Austrians were totally defeated, although not before they had made a most desperate struggle. This was the last battle in which the archduke took part. He lived the rest of his life in retirement, becoming duke of Saxe-Teschen in 1822.

Charles 'Martel' ('the Hammer') (A.D. 689-741), natural son of Pépin d'Héristal, mayor of the palace under the later Merovingian kings, grandfather of Charlemagne. In 714 the Austrasian Franks chose him as their duke: by force of arms he united the kingdoms of Neustria and Austrasia, 720, becoming virtual ruler of the Franks, the titular kings (among them Chilperic II. and Clotaire IV.) being merely his puppets. He fought against Saxons, Alemanni, and Bavarians, and rolled back the tide of Moslem conquest in the desperate and famous battle between Tours and Poitiers, 732. For this crushing defeat of the Saracens he was given his surname, and looked upon as the saviour of Christendom (see Gibbon). C. tried to convert Saxony and Frisia to Christianity and helped St. Boniface in his missions. He again drove the Saracens out of Burgundy and Langue doc, 737. On his death he left the kingdom to his sons, Carloman and Pépin le Bref. See Baron de Nolinse, *Charles Martel, histoire des maires du palais*, 1851; U. Chevalier, *Bio-bibliographie*, 1904.

Charles of Blois (1319-64), duke of Brittany, sometimes known as C. of Châtillon. Married the daughter and heiress of Guy of Brittany. On the death of the latter, the succession of his daughter, Jeanne, wife of C. of B., was disputed. C., aided by his uncle Philip VI. of France, was able at first to defeat John of Montfort l'Amaing, who was supported by Edward III. of England. But his success was only transitory, and in 1347 he himself was wounded and taken prisoner. He was only released in 1356, but continued the war, and finally perished at the battle of Auray. He was noted for the consistent piety of his life, and was canonised by the Rom. Church.

Charles of Orleans, see ORLEANS, CHARLES, DUKE OF.

Charles the Bold (le Téméraire) (1433-1477), duke of Burgundy, son of Philip the Good. Before the death of his father he bore the title of count of Charolais, and during his youth he quickly estab. a reputation for himself as a general and warrior. In 1465 he became the practical ruler of the duchy, and adopted at once his policy of opposition to the aims of

Louis XI. He succeeded after hard fighting in wresting from Louis XI. by the treaty of Conflans some of the privileges which Louis had gained, and just previous to the death of his father was engaged in subduing a revolt of the townsfolk of Liège, a revolt which was renewed when he succeeded to the duchy. His successes had aroused the anger of Louis XI., who desired to curb as much as possible the ambitions of Burgundy. Negotiations were opened at Péronne, and although C. was convinced of Louis's double dealing, still, at the same time, he treated with him. The treaty of Péronne was futile, and in the following year Louis seized some tns. on the Somme, whilst C. invaded France and laid it waste as far as Rouen. From 1470 onwards C. was engaged upon wider schemes than simply checking the ambition of Louis. He desired the restoration of the middle kingdom, and aspired to the kingship himself. He had added to his ter. and power, but in so doing he had raised up many enemies. He had offended the emperor, he was at enmity with the Lorrainers and Swiss, and finally, after sev. defeats, he was overthrown and slain before Nancy. His body was only recovered sev. days after the battle. The death of C. extinguished the male line of the dukes of Burgundy, and with it the grandeur and importance of the duchy. C. had left an only daughter, Mary, who succeeded to all the dominions of her father out of France. She married the Archduke Maximilian, to whom her father had proposed her, and through whom her Flemish possessions descended to the Sp. branch of the house of Austria. There are lives by J. F. Kirk, 1863; R. Putnam, 1908, and J. Bartier, 1941.

Charles, Mrs. Elizabeth (1828-96), b. at Tavistock, Devonshire, the daughter of John Rundle. She was the author of many books of a semi-religious character, the chief of which, *The Chronicles of the Schenberg-Cotta Family* (1864), is about Martin Luther, and has been trans. into most of the European languages, into Arabic and many Indian dialects. Others of her books are *The Diary of Mrs. Kitty Trevelyan* (1865), dealing with the rise of the Methodists in England; *The Dragonets and the Darcenants* (1867), about the Eng. Civil war; *On Both Sides of the Sea* (1868), a tale of New England. Among her friends were Dean Stanley, Charles Kingsley, Jowett, and Pusey.

Charles, Robert Henry (1855-1931), Brit. theologian, b. in co. Tyrone, N. Ireland; educated at Queen's Univ., Belfast, and Trinity College, Dublin. He left parochial work in 1889 to devote himself to the studies which made him famous, choosing a line of research, the Testaments of the Twelve Patriarchs, till then little known and involving a great effort of the acquisition of oriental languages. He began the series of these eds. in 1893 with *The Book of Enoch*, continued with kindred documents, and ended with the *Testament of the Patriarchs* in Gk., with variants from the versions in Heb., Aramaic, Armenian, and Slavonic, in 1907. He

was Schweich lecturer for the Brit. Academy, and received the first award of the academy's medal for biblical studies. His industry as an editor made him master of the thought and the doctrinal development of the age of the Apocrypha, as appears in his historical study, *A Critical History of the Doctrine of a Future Life* (1899), and in *Religious Development between the Old and the New Testaments* (1904). His ed. of *The Apocrypha and Pseudepigrapha of the Old Testament* was issued in 1914, and throughout the years of the First World War he laboured at his great work on the Book of the Revelation of St. John, with a succession of students to assist him. This book is notable for positive pronouncements on points generally regarded as largely conjectural, and it roused the resentment of the advocates of literal inspiration; but, generally speaking, it has met with the widest commendation. C. was appointed to a canonry at Westminster Abbey in 1913 and became archdeacon there in 1919.

Charles, Thomas (1755-1814), Welsh preacher and author. He early came under the influence of Rees Hugh, a disciple of Griffith Jones, and joined a Methodist society. He met many noted evangelical leaders at Oxford from 1775 to 1784; in the latter year became curate of a charge in Somerset. His opinions made it difficult for him to retain a post in the Estab. Church, and after 1784 he threw in his lot altogether with the Methodist body. He did much valuable work in the introduction of Sunday schools, and the printing and distribution of religious books in Welsh.

Charles City, city of Floyd co., Iowa, U.S.A. Pop. 8000.

Charleston: 1. Cap. city and seaport of C. co., S. Carolina, U.S.A., standing on a low tongue of land between the Rs. Ashley and Cooper, 7 m. from the Atlantic. The two rivers unite just below the city and form a spacious harbour, about 15 sq. m. in area. Across the entrance is a sand-bar with only about 18 ft. of water, but having a deeper channel near Sullivan's Is. By recent improvements, vessels of 24 ft. draught can safely enter. The city is regularly and handsomely built, retaining many of the features of old S. architecture, and having a profusion of trees and gardens. Standing as it does in a rich cotton and rice dist., C. has a large trade, and is the chief commercial city of S. Carolina. It is the terminus of the railway lines, and steamships run regularly to and from the chief ports of the U.S.A., the Antilles, S. America, and Europe. The chief exports are cotton, rice, phosphate, naval stores, lumber, and grain. There are machine-shops, shipyards, dry docks, and manufs. of cotton, flour, carriages, baggage, textiles, and fertilisers, the last, owing to the large deposits of lime-phosphates found on the Ashley R., being the main industry. C. is the seat of a Catholic bishop. The city was founded by the Brit. under Wm. Sayle about 1670. The Civil war began in 1861 with the capture by the S. Caro-

linians of Fort Sumter, on an is. 1 m. below the city. It suffered terribly in an earthquake in 1886. Pop. 72,000. 2. Cap. of W. Virginia, U.S.A., and co. seat of Kanawha co., on the N. bank of the Kanawha R., at the mouth of the Elk, about 200 m. E. of Cincinnati, Ohio. It is the centre of a dist. containing bituminous coal, oil works, iron and salt mines. The manufs. include axes, chemical fire-extinguishers, lumber, furniture, and woollen goods. Pop. 62,000. 3. City of Coles co., Illinois, U.S.A. Pop. 8200.

Charlestown: 1. Fishing vil. and seaport, 2 m. S.E. of St. Austell, Cornwall, England; has boat-building yards and exports china clay. Pop. 3000. 2. Tn. in N.W. of Natal, 5000 ft. above sea level, close to Majuba Hill and Laing's Nek, and until 1895 the terminus of the railway from Durban. 3. Chief tn. of Nevis Is., Leeward Is., W. Indies. Pop. 1100. 4. Originally a city in the state of Massachusetts. It is now, however, a part of Boston, and contains the Bunker Hill monument commemorating the battle of that name.

Charles's Law. In heat, the law that equal vols. of all gases, when heated under constant pressure, expand by equal fractions of their vols. at 0° C. for each degree rise of temp. This fraction—the coefficient of expansion of gases at constant pressure—is equal to $\frac{1}{273}$.

Charles's Wain, see *CRUSA MAJOR*.

Charlet, Nicolas Toussaint (1792-1845), Fr. designer and painter, b. in Paris. He served in the National Guard in 1814, but lost his employment as clerk in the *mairie* (1816) owing to the political changes. He then studied art under Gros, and was particularly successful in military subjects (*C Grenadier de Waterloo*, 1817) and sketches of children. See *La Combe, Charlet, sa vie et ses lettres*, 1858.

Charleville: 1. Mk't tn., 34 m. N. of Cork, co. Cork, Ire.; pop. 1926. 2. Tn. in Queensland, the terminus of the W. railway, 130 m. N.W. of Brisbane. The railroad is linked to Camooweal, near the Barkly Tableland, by a weekly air-mail. Pop. 2300. 3. Tn. of Ardennes, France, on R. Meuse, opposite Mézières. Has manufs. of metal goods, fire-arms, and nails, and a large trade. The public library is very fine. Pop. 23,000.

Charlevoix, Pierre François Xavier de (1682-1761), Fr. Jesuit missionary and traveller, b. in Saint-Quentin, joined the Jesuits, 1698; taught in their college at Quebec, 1705-9; travelled up the Great Lakes and down the Mississippi to New Orleans, 1720-22. Wrote a tour., sev. hist., and *Histoire et description générale de la Nouvelle France* (1744) (Eng. trans. by J. G. Shea, 1866-72).

Charlieu (anc. *Carilocus*), tn. of Loire, France, near the border of the dept., 10 m. N.E. of Roanne. It has manufs. of textiles. Pop. 5000.

Charlock, species of *Crucifera*, is the *Sinapis* (or *Brassica*) *arvensis* found in Brit. cornfields, and usually known as the wild mustard. The small, four-petaled flowers make a pretty sight in the summer

time, but the plant is very troublesome to farmers, and is difficult to destroy.

Charlotte: 1. Co. seat of Mecklenburg co., N. Carolina, U.S.A., on Sugar Creek, in the S.W. of the state, 175 m. S.W. of Raleigh. The terminus of sev. railways, and has manufs. of carriages, cotton mills, machinery, furniture, and cotton-seed oil. A branch mint was estab. here in 1837, and the Johnson C. Smith Univ. (for coloured students) in 1867. Pop. 101,000. 2. Co. tn. of Eaton co., Michigan, U.S.A., 20 m. S.W. of Lansing. It has carriage factories, flour mills, and malt works. Pop. 5500.

Charlotte Amalie, the only tn. on the is. of St. Thomas (*q.v.*) in the Virgin Is. group (belonging to the U.S.A.). It was so named after the consort of King Christian V. of Denmark, to which country the is. belonged up to 1917, when it was purchased by the U.S.A. The U.S. Geographic Board decreed on Jan. 5, 1921, that the tn. would in future be known as St. Thomas, but its more picturesque name was restored to it in 1937. The harbour is one of the finest in the W. Indies; there is a large coaling station and a floating dock. Pop. 11,000.

Charlotte Augusta, Princess (1796-1817), was the daughter of George, Prince of Wales (afterwards George IV.), and Caroline of Brunswick. Her parents separated when she was a few months old, and while she lived she was a source of contention between them. Both father and mother desired to have the custody of her, but while she was growing up George III. decided to entrust her to neither, and she was placed in charge of governesses. She became engaged in Dec. 1813 to William, hereditary prince of Orange; but discovering that to marry him would mean residence in Holland, she broke off the match. On May 2, 1816, she married Prince Leopold of Saxe-Coburg, and died in childbirth on Nov. 5 of the following year. There is a biography by Lady Rose S. M. Welfall, 1874.

Charlottenberg, tn. in Sweden, co. Vermland, 21 m. N.N.W. of Arvika, and 3 m. from the Norwegian frontier. The centre of the iron-working industry.

Charlottenburg, until 1920 a tn. of Brandenburg, Germany, but in that year it was incorporated in Berlin, in which its pop. is included. Its old name was Lietzenburg. It grew up around the palace which Frederick I. built for Sophia Charlotte in 1696, and was well built and laid out. The palace, with its park, in which is the mausoleum containing monuments to Queen Louisa, the Emperor Frederick William III., the Emperor William I., and the Empress Augusta, was the chief attraction, but there were also an institute of glass-painting, schools of artillery and engineering, an institute of technology. But, together with other suburbs, C. was very heavily damaged in the allied aig. raids on Berlin and in the siege by the Russian armies. Its pre-war manufs. included ironware, machinery, porcelain, glass, paper, leather, chemicals, beer, electric appliances, pottery, and stoneware, and there were iron foundries

and machine shops. *See also* EASTERN FRONT, OR RUSSO-GERMAN CAMPAIGNS, IN SECOND WORLD WAR.

Charlottesville, city in Albemarle co., Virginia, U.S.A., on R. Rivanna, 90 m. N.W. of Richmond. The seat of the Univ. of Virginia, founded by Thomas Jefferson in 1820, which has a fine natural hist. museum, an observatory, and a library. Agric. implements and cigars are manuf., and there are iron works and wool mills. Pop. 16,000.

Charlottetown, cap. of Prince Edward Is., Canada. It is situated on the S. side of the is., in Queen's co., on the Hillsborough estuary, and possesses a large and safe harbour. Its chief buildings are the Prince of Wales College, the Rom. Catholic College of St. Dunstan's, and a normal school. Its manufs. include woollen goods, lumber, furniture, and canned goods. It has also shipbuilding and foundry works. Pop. 14,500.

Charlton, dist. of London, England. It is in the bor. of Greenwich on the S. bank of the Thames. C. House, now the property of the bor. council, is an excellent example of Jacobean architecture.

Charm (through Fr. from Lat. *carmen* a song), form of words, generally a verse, which when said or sung is supposed to have power to avert evil or bring good luck. When worn in written form about the person it is called an amulet. The meaning of the term has been extended figuratively to pleasing qualities of appearance or manner. *See* INCANTATION and AMULET.

Charmey, canton of Fribourg, Switzerland, 15 m. S. of tn. of Fribourg. A favourite tourist resort, and the centre of the Gruyère cheese industry.

Charmouth, par., vil., and watering-place in W. Dorsetshire, 6 m. S.E. of Axminster. Pop. 700.

Charnak, *see* BARRACKPUR.

Charnel-house, place for the deposit of bones thrown up in digging. Sometimes a separate building, but often a part of the crypt of a church.

Charnock, Job (d. 1693), Eng. founder of Calcutta. Arrived in India about 1655, and entered the E. India Company. He refused to move when besieged by the Mogul's viceroy at the vil. of Sutanuti, and finally obtained the grant of the site upon which Calcutta now stands.

Charnwood Forest, tract in the N.W. of Leicestershire, England. Though a great part of it is barren, the scenery is pretty and it has considerable geological interest. The lowest elevation is 600 ft., while Bardon Hill, the highest point, is 912 ft. It contains coal mines and granite quarries, and the Whittle Hill bones come from there. It was enclosed by Act of Parliament in 1812.

Charolais, or **Charollais,** old dist. of France, which was situated in the S. of Burgundy, and now forms a part of Saône-et-Loire. The counts of C. took their title from it. The dist. now is famous for its cattle.

Charolles, tn. of Saône-et-Loire, France, 39 m. W.N.W. of Mâcon. On a neighbouring hill is the ruined castle of the

counts of Charolais which has been transformed into a tn. hall. Pop. 3400.

Charon, in Gk. mythology, the son of Erebus and Nox. He ferried the souls of the dead across the rive. of the lower world. Each shade paid him one obolus, which was placed in the mouth of the dead body before burial.

Charon of Lampascus, Gk. historian, probably of the early fifth century B.C., and certainly before Herodotus. He is known to have been alive in 464 B.C. His works, which include hist. of Lampascus, Creto, and Persia, have only survived in fragments, which have been ed. by F. Creuzer (Heidelberg, 1806) and by C. and T. Müller (Paris, 1841). He is mentioned by Tertullian and Suidas.

Charondas, celebrated Gk. law-maker of Catana, Sicily. His date is not known, but the tyrant Anaxilaus of Rhegium, 494-476 B.C., abolished the laws which were in force. His laws were adopted by the Chalcidian colonies in Italy and Sicily, and according to Aristotle their chief import lay in the precise rules against perjury, fines on judges who neglected their duties, etc. The story of his suicide because he broke one of his own laws is also told of Diocles and Zaleucus.

Charonne, former vil. of Seine, France, now forming one of the outlying arrons. of Paris added to the city in 1860.

Charpentier, Gustave (b. 1860), Fr. composer, b. at Dieuze, June 25. After studying at the Lille Conservatoire, he was awarded a pension to enable him to continue study in Paris, whither he went in 1881. Six years later he received the Prix de Rome for his cantata *Didon*. In 1902 he founded the 'Cercle Mimi Pinson' and the Popular Conservatoire to give free courses of popular music and in classical dancing. He succeeded Massenet in 1912 as a member of the Institute. His fame rests mainly on his opera *Louise*, a musical romance produced in 1900, and performed some five hundred times in the ensuing twenty years. His appeal is essentially popular and romantic, and he tries, not without success, to give social questions an appropriate musical setting. Among his other works are *Impressions d'Italie* (orchestral suite) (1890); *La Vie du Poète* (symphonic drama) (1892); *Julien* (opera) (1913). His songs include *Poèmes chantés* (1894); *Les Fleurs du Mal* (from Haudelaire) (1895); and *Impressions fausses* (from Verlaine) (1895). Consult A. Brunon, *La Musique française*, 1901.

Charpentier, Jean de (1786-1855), geologist, b. at Freiberg in Saxony. He was appointed chief engineer of the salt mines at Bex (Vaud, Switzerland) in 1813, but his fame as a geologist rests on his book *Essai sur les glaciers, et sur le terrain erratique du bassin du Rhône* (1841), in which he extended and proved the theory, which had previously been evolved by Venetz, that the blocks on the slopes of the Alps and Jura, although of quite different sorts and periods of rocks, had been brought there by glaciers, and left when the glaciers themselves disappeared. But his theory of the dilatation of glaciers was disproved by J. D. Forbes

in his *Travels through the Alps of Savoy* 1842.

Charpentier, Marc Antoine (1634-1704), Fr. composer, b. and d. in Paris. Studied painting in Italy but gave it up for music, which he studied under Giacomo Carissimi, composer of many oratorios, whose work C. greatly admired. He was master of music in the household of Mlle de Guise, and he also gave music lessons to the duke of Orleans, regent of France. Became Kapellmeister of the Sainte-Chapelle and remained so till his death. He was associated with Molière in the performance of some of his plays. His *Médée*, described as 'une tragédie lyrique,' words by Thomas Corneille, was performed in Paris (1693) with success, yet was never repeated. His other works include the operas *Circé* and *Amours d'Acis et Galatée*, but he is chiefly remembered for his oratorios, in the style of his It. master, and his masses.

Charr, or **Char**, the name of sev. species of *Salvelinus*, the salmon and trout genus which is typical of the family Salmonidae; they differ from their allies in having teeth on the head only of the vomer. The deeper parts of fresh-water lakes are their favourite habitation; *S. alpinus*, the N. C., is common to England and Switzerland; *S. Willughbi* is a native of Lake Windermere; and *S. fontinalis* is the Amer. brook trout.

Charrière, Isabelle Agnes van Teyuyl, Madame Saint-Hyacinthe de (1741-1805), b. at Utrecht, Holland; married her brother's tutor and settled at Colomblar, near Lausanne. Her *Lettres neuchâtelaises* (1784) made her famous. Her long friendship and liaison with Benjamin Constant is her chief claim to remembrance. See P. Godet, *Mme de Charrière et ses amis*, 1904.

Charrington, Frederick Nicholas (1850-1936), Eng. social reformer, b. at Bow, son of Frederick C., a wealthy brewer, but gave up the succession to a fortune of over £1,000,000 in order to devote his time to temperance work. In 1885 he founded the Tower Hamlets Mission; made the Great Assembly Hall in the Mile End Road a centre of Christian work in the E. end of London. Member of L.C.C. 1889-95. Prominent in an attack on music-halls.

Charron, Pierre (1541-1603), Fr. philosopher and theologian, b. in Paris, the son of a bookseller. He studied law, but his practice as an advocate was unsuccessful, and he entered the Church, becoming a well-known preacher and obtaining the post of preacher in ordinary to Marguerite, wife of Henry IV. His friendship with Montaigne is famous. In 1594 he pub. *Les Trois Vérités*, in defence of Catholicism. His great ethical treatise, *Traité de la sagesse* (1601), showed a remarkable change. It is entirely sceptical and rationalist in principle, and was violently attacked by the Jesuits, and C. was denounced as an atheist. His sudden death from apoplexy was regarded by the orthodox as a judgment for his impiety. See W. E. H. Lecky, *Rationalism in Europe*, 1865.

Charruas, tribe of S. Amer. Indians, noted for their warlike propensities. At one time they inhabited Uruguay and part of S. Brazil, and Gauchos, who now occupy that part, have a strain of Charrua blood in them. They were well-made, dark-skinned people, and used horses in their wars with the Spaniards, their weapons being the bolas, or weighted lasso, and bows and arrows. Juan Diaz de Solis lost his life at their hands, 1516.

Charsadda, tu. in Peshawar, N.W. Frontier prov., Pakistan, 14 m. N.W. of Peshawar. It is supposed to be the same as Pushkalavati, which was in existence at the time of Alexander the Great's invasion, and the Peukolaotis mentioned by Gk. historians, the adjoining vil. of Prang no doubt forming part of it. Some interesting earthenware jars bearing inscriptions have been found in the neighbourhood. Pop. 9000.

Chart, or **Sea-Chart**, marine map, showing the coasts, i.e., lighthouses, and ships, soundings, currents, etc., of a part of the sea, compiled for the use of navigators. Cs. seem to have been made as early as the thirteenth century, the invention being variously ascribed to the lts. and to Prince Henry of Portugal. The first C. to recognise the roundness of the earth was produced by Mercator in 1569, and his system was improved by Edward Wright in 1594. Modern Cs. are prepared in Great Britain by the hydrographic dept. of the Admiralty. They are supplied gratis to the navy and sold to the merchant service through agents. Valuable Cs. of the coasts of the U.S.A. have been pub. since 1807 by the Coast Survey. Cs. are constructed with the greatest possible accuracy, and the use of recognised symbols admits of the inclusion of considerable detail. Prominent features on land which may serve as landmarks, shore-lines at high and low water, details of tide in harbours, the proper courses for entering ports and channels, and the buoys marking them, etc., are shown. Signal stations and lights receive detailed attention, lights being shown by a yellow circle surrounding a red dot, with abbreviations describing whether the light is fixed, flashing, or revolving. Deep-water soundings are given in fathoms, and shallow-water soundings in feet. The character of the sea-bottom is also indicated, and sandbanks, bars, rocks, hidden, awash, or protruding, currents, and sunken wrecks are clearly shown. Lines of lat. and long. are drawn in, and sev. compass-roses, showing magnetic variation, appear on different parts of the C. The Mercator projection is generally used, but polyconic Cs. are issued of small areas, and the gnomonic projection is used for mariners wishing to follow great-circle courses. After the Second World War, the hydrographic dept. of the Brit. Admiralty commenced the task of recharting the oceans of the world with the assistance of the 'echo-sounder,' a device based on radar (q.v.), which records electric impulses reflected off the sea-bed, thereby giving a picture of its configuration.

The aeroplane is also employed in modern chart-making in shallow waters. Simultaneous vertical air pictures on panchromatic film are taken by dual cameras, fixing the depth by contrast to within 3 ft. See Hydrographic Dept., *Charting the Seas in Peace and War* (I.M.S.O.), 1948.

Charte, charter or system of constitutional law, contained in a single document. The Grande C., or the Charter of King John, 1355, was the first such document known in France. The constitution to which the name C. was the most often given was the one in which Louis XVIII. acknowledged the rights of his subjects upon his restoration to the throne, 1814. Since that time this C. has been held as the fundamental law of constitutional monarchy, whenever that particular form of gov. has existed in France.

Charter (Lat. *charta*; Gk. *χάρτης*, signifying paper). The usual import of the word indicates any formal writing in evidence of a contract, or agreement between persons. In England we no longer use the word to signify a written document, though in France it is still in use. In private affairs, its most general use is in the transference of estates, the written documents given by the former owner as a proof of the transference being called a C. In public affairs, it is the name given to the deeds by which those in power guarantee the rights of their subjects. There may be also a C. of a bank, or some other association, whereby it may confer privileges and powers on a body of persons for some particular object. In Scotland, a C. is the written evidence of a grant of heritable property, under certain conditions enforced by the feudal law, i.e. that the person receiving shall pay at stated times a sum of money, or perform certain duties to the person conferring the property.

Charter, the Great, see MAGNA CHARTA; ENGLISH HISTORY.

Chartered Companies. The common element in C. C. at all stages of their development is the possession of a special charter from the Crown, granting them certain trading privileges in a particular locality, to be exercised subject to a varying degree of control by the Crown. There appear to be three tolerably well marked phases in the development of C. C., the final if unintended or unavowed cause of which, judged by the light of later experience, is the foundation of a colonial empire. C. C. appear, first, as associations of individuals, emanating from early trading guilds, and enjoying a monopoly of trade in the exportation of Eng. products to other European nations. England first granted a charter to a foreign country, the Hanseatic League, and, later, charters were granted to Eng. companies trading in the Baltic, Russia, and Turkey. Secondly, as chartered associations possessing delegated sovereign powers of extraterritorial jurisdiction in the countries in which they traded. The rise of these later companies

was a consequence of the impulse given to foreign trade by the discovery of the New World and the opening out of trading routes to the Indies and America, and the object of their formation was to foster commercial intercourse with distant countries. The Russia Company, the Turkey Company, the Eastland Company developed such relations with Russia, Turkey, and Persia. But the more important were the Hudson's Bay Company, and a number of other C. C. that opened up the Brit. N. Amer. colonies, and the famous E. India Company. The significance of these companies lies in the part they played in the building up of the foundations of the Brit. colonial empire through their acquisition of ter. either by the process of planting and settling in unoccupied regions or by conquest or cession of occupied land, as in the case of India. Thirdly, as purely joint-stock companies possessing no delegated sovereign powers, and trading under the direct control of the Brit. Gov. This phase of their development, or rather revival, was the expression of the desire for colonial expansion and commercial prosperity universally prevalent among the European nations towards the end of the nineteenth century. The prin. Eng. C. C. formed during this period were the Royal Niger Company, chartered in 1886 and bought out by the gov. in 1899 for £265,000; the Imperial Brit. E. Africa company, formed in 1889 to exploit Uganda and neighbouring dists., and which fell into financial straits in 1892, with the result that Uganda became a Brit. protectorate some two years later; the Brit. S. Africa Company, chartered in 1889, and owing its origin to the activities of Cecil Rhodes, who secured various mining concessions from Matabele chiefs; and the Brit. N. Borneo Company, incorporated in 1881 to take over the concessions and ter. acquired from the sultan by a syndicate formed in Labuan in 1878. Some of the C. C. of the latter two places still exist as companies, but in most cases they have been merely a step, though an important one, in the transition from exploitation to colonial expansion, and their rights and treaties have for the most part been bought out by the Crown. The greater degree of success in this direction of the latter companies was due to their more economic organisation, their control of a larger capital, enjoyment of better credit, their closer surveillance by the Brit. Gov. with a view to safeguarding the rights of native rulers, and the absence of any monopoly in trading rights. The rights of the Brit. N. Borneo Company were bought out by the Crown in 1946 when N. Borneo became a crown colony.

Charterhouse, corruption of *Chartreuse*, a religious house of the Carthusian order. In sev. places in England the name occurs, such as C-on-Mendip C. Hinton, thus denoting where the Carthusians estab. themselves in the past. The most celebrated is the C., London. In 1371 Sir Walter de Manny founded a C. monastery by the old city wall of London.

Upon the dissolution of the monasteries in the time of Henry VIII., the property passed through many hands, until, in 1611, it was bought by one Thomas Sutton, 1532-1611, a native of Snaith, Lincolnshire. The same year of his death he founded a hospital on the site of the monastery, and in his will bequeathed moneys with which to found a chapel, almshouse, and a school. The almshouses provide for eighty inmates, who must be over fifty years of age and according to the founder's wish, 'gentlemen by descent and in poverty, soldiers who have carried arms over sea and land, merchants whose livelihood was destroyed by shipwreck, or other misfortune, or servants in the royal household.' The school ranks among one of the foremost of the public schools and has by now far outgrown the original intentions of the founder. In 1872 it was removed to Godalming and the old buildings were sold for the accommodation of the Merchant Taylors' School (moved to Moor Park, near Northwood, in 1932). The quaint old chapel and hospital still remain on the old site, but suffered severely by bombing during the Second World War.

Charter-party (Fr. *charte-partie*, divided deed, one given to each party concerned), in maritime law a contract by which the owner or master of a ship lets the ship or part of her to a second party for the purpose of conveying goods from one port to another. It is one form of the contract of affreightment, the other being the bill of lading (used when the goods shipped form only part of the intended cargo). A C. may be a lease of the vessel (the charterer then assuming entire charge, while the master is only his agent), but more often it merely gives the shipper permission to have his cargo conveyed in the chartered vessel, the master assuming the responsibilities of a common carrier. Usually the C. describes the contracting parties, the ship, and the voyage. The shipowners state that she is seaworthy, will take the cargo at a certain charge, and make the voyage as quickly as possible, delivering the cargo within a fixed time. The freighter agrees to load and unload within a certain number of lay or running days. The rate and time of payment for the freightage, and date of the beginning of demurrage, are also stated. The contract may be for a definite time, or for definite voyages. Perils of the sea for which the shipmaster declines to be responsible are noted down. See Scrutton, *Contracts of Affreightment as expressed in Charter-parties and Bills of Lading* (12th ed.) 1925.

Charters Towers, mining tn., Devonport co., Queensland, Australia, 82 m. S.W. of Townsville. It is the centre of a famous gold-field, the gold being of very fine quality. An excellent water supply is available from the Burdekin R. Pop. 7000.

Charters Town, royal grants of certain privileges, rights, or immunities made to tns. from early times. William I., seeing the importance of the tns., included most

of them in the royal domesne, and the practice arose of granting C. of incorporation, with privileges. Such privileges were, generally, the right of independent jurisdiction and the right of paying *firma burpi*, or a fixed sum as rent to the king in lieu of submitting to the exactions of the sheriffs. These C. were granted to the 'fully qualified members of the township or hundred court of the town,' either by the king, or, in the case of tns. belonging to nobles, by the owner—thus Leicester obtained a charter from its earl and Beverley from Archbishop Thurstan. Most of the large tns. seem to have been vested in the Crown in the time of Henry I., and by the reign of Henry III. had succeeded in obtaining a clear recognition of their privileges and immunities. The readiness with which the tns. undertook municipal gov., and the ease with which they were incorporated by charter, was due to the fact that they already had a more or less complete organisation in the gild system (Stubbs's *Select Charters*). When in course of time the election of the mayor of a municipal bor. passed from the whole body of burgesses to the aldermen and councillors, the latter formed themselves into a close corporation, ignored the rights of their fellow townsmen, and secured their position by applying for and obtaining C. of incorporation framed according to their wishes and modifying any charter or C. which the tn. may already have possessed. This restrictive tendency was carried still further towards the end of the fifteenth century. The rights of the freemen disappeared, the corporation came to be looked upon as the owner of the tn. property, and developed into an exclusive oligarchy; and even the election of members of Parliament was, in some cases, entrusted into their hands. In this way the Crown could secure the return to the Commons of its own candidates; but the independence shown by the corporations under the Stuarts moved Charles II. to remodel their C. He proceeded against the corporations by writ of *quo warrantum* (q.r.), calling on the corporation to show by what authority it exercised its prerogative powers (it may be noted that in 1690 an Act of 2 William & Mary c. 8 declared all these legal proceedings null and void). The C. of the tns. surrendered through the instrumentality of the notorious Judge Jeffreys were replaced by others 'framing the constitution of these municipalities in a more oligarchical model and reserving to the Crown the first appointment of those who were to form the governing part of the corporation' (Hallam). The very use of the word oligarchical shows that the king was concerned not for the rights of the burgesses but for his own powers. James II., in the hope of conciliating the nation over the abrogation of its privileges, restored a number of the old C.; but this in no way improved the position of the burgesses as a whole, and throughout the eighteenth century the principle of the close corporation was maintained and all the bor. patronage was

in the hands of the councillors, who almost invariably neglected their duties to the tn. in order to further their own private interests. This corrupt state of things continued until the Municipal Corporations Act of 1835, which made provision for the election of the tn. councillors by the burgesses or resident ratepayers (see further under LOCAL GOVERNMENT). See also MUNICIPALITIES, and under the names of the various large cities or tns. of Britain.

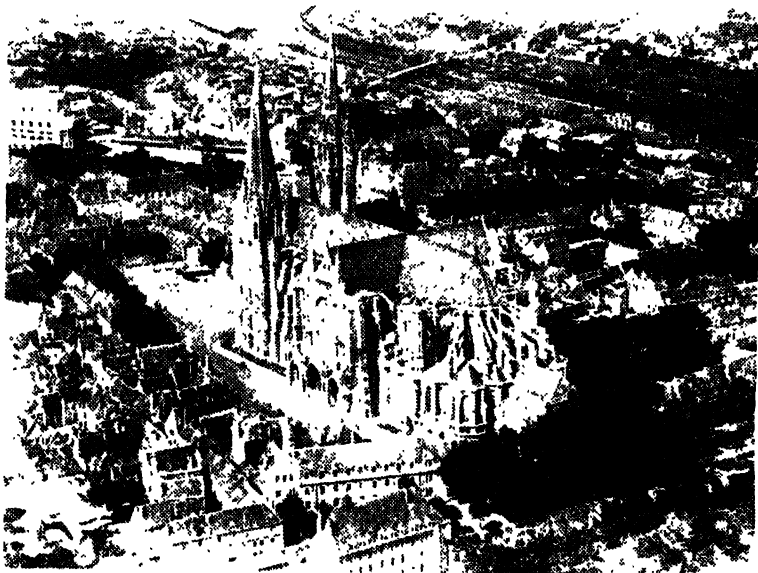
Chartier, Alain (1385-1433), Fr. poet and satirist, b. at Bayeux, studied at the univ. of Paris. His first poem, written after the battle of Agincourt, was *Liure des quatre dames*; his *Belle Dame sans merci* was trans. into Eng. by Sir Richard Ros about the middle of the fifteenth century. He was made secretary to the dauphin, afterwards Charles VII. In 1422 he wrote his famous *Quadrilogue invectif*, describing the sufferings of the people or appealing to national patriotism to combine against the common enemy. By his eloquence and patriotism he cheered his countrymen with the belief that the cause of France was not lost. The story of the kiss given to him by Margaret of Scotland for his poems is a fable. His satire on the court, *Le Curial*, was trans. by Caxton, 1484. He attacked the vices of the clergy in the *Liure d'espérance* (1429), and his *Breviaire des nobles* was studied by the youthful members of every noble household. His influence on Clément Marot, John Lydgate, and others was great.

Chartists, name given to a body of political reformers (largely working men), who sprang up in England about 1838. Discontent and disappointment were felt among the workers of Britain after Grey's reforms and the Bill of 1832, resulting in the movement known as Chartism, from the document or charter in which the agitators presented their demands publicly. In 1838 six members of the House of Commons held a conference with representatives of the Working-men's Association, and together they drew up the People's Charter for alleviating the sufferings of the artisans and labouring classes. They petitioned for (1) universal suffrage (of men), (2) abolition of the property qualification for a seat in Parliament, (3) annual Parliaments, (4) equal representation, (5) payment of members of Parliament, (6) vote by ballot. Among the chief Chartist leaders were Feargus O'Connor, Thomas Attwood, the Rev. J. R. Stephens, Richard Oastler, Wm. Lovett and Henry Vincent (both working men), Ernest Jones, Thomas Cooper, and Henry Vincent. The *Northern Star* became the newspaper organ. In 1839 the National Charter Association was formed in Birmingham, and by 1848 the magnitude and significance of the agitation were felt in the highest degree. Members of the extreme section favoured appeals to arms, or popular risings and riots, if their demands could not be obtained by peaceable methods (cf. militant suffragists of the years immediately before the First World War).

This section of the C. were called physical-force men. Their demands were adopted from earlier reformers, John Cartwright's (*q.v.*) *Plan of Reform*, 1776, and the duke of Richmond's Bill, 1780, known as the People's Rights measure. The struggle of the C. may be divided into two periods—1836-39, aiming merely at industrial amelioration, and 1840-48, taking on rather the nature of a socialistic revolution. The second period was more

Hammond, *The Age of the Chartists, 1832-1854*, 1930.

Chartres, cap. of the dept. of Eure-et-Loir, 55 m. S.W. of Paris, and situated on the l. b. of the Eure. The tn. is divided into two parts—upper and lower—which are connected by very steep roadways. It is famed for its fine cathedral, Notre-Dame, founded in the eleventh century by Bishop Fulbert, and regarded by some as the finest church in



CHARTRES CATHEDRAL

E.N.A.

important for this very socialistic character. The C. refused to support the Anti-Corn Law League, as helping only the middle classes. Disturbances were most frequent in the N. Finally a great demonstration was announced to be held on Kennington Common. Gov. forbade the procession, and Wellington posted troops to guard the city, special constables being also enrolled, among them being Louis Bonaparte (Emperor Napoleon III.). As a party the C. disappeared after 1849, the movement declining partly owing to improved conditions of labour, partly to the legislative concessions made in reform Bills. See R. C. Gammage, *History of the Chartist Movement, 1837-54*, 1894; T. Carlyle, *Chartism*, 1840; C. Kingsley, *Alton Locke*, 1856; *The Life of Thomas Cooper, written by Himself*, 1872; J. McCarthy, *A History of Our Own Times, 1874-80*, 1905; M. Howell, *The Chartist Movement*, 1925; J. L. and B.

France. Its towers are noted for their beauty and perfect proportion; the one, 351 ft. high, dates from the twelfth century; the other, 377 ft., and of a far richer design, was not finished until the sixteenth century. The tn. is the seat of a bishop, a court of assizes, and possesses a chamber of commerce, training colleges, a communal college for girls, and a *lycée* for boys. The corn market, which is held once a week, is one of the largest in France. The industries are chiefly flour-milling, brewing, distilling, iron-founding, leather manuf., dyeing, making of stained glass and hosiery. In 858 C. was burnt by the Homs., and in 911 unsuccessfully attacked by them. In 1417 it fell into the hands of the Eng., who lost it again in 1432. In 1591 it was taken by Henry IV., who was crowned there in 1594. In the Franco-Ger. war it was taken by the Gers., and during that time it was an important centre of operations. In the

Second World War. C. was held by the Gers. from 1940 to 1944. It was recaptured by Gen. Patton's troops on Aug. 17, 1944. Pop. 26,400.

Chartreuse, La Grande, formerly a Carthusian monastery, founded in the year 1084 by St. Bruno. It is situated in a wild, picturesque valley in the Fr. dept. of Isère, about 13 m. N. of Grenoble. Its name was derived from a neighbouring vil. called Cartusia, now known as St. Pierre de C. The original monastery was founded between the years 1132 and 1137, but that of to-day dates only from 1676, the one of earlier times having been destroyed by fire. It contains four halls, where formerly the priors of other monasteries in France, Burgundy, Germany, and Italy used to be entertained. The chapel dates from the fifteenth century, but the cloisters, with their thirty-six houses, which were built for the use of the monks, are of later date. The monks were famed throughout the world for their manuf. of the celebrated liqueur. Since the expulsion of the monks in 1903, the buildings had been falling into decay but have been restored. In 1181 a Carthusian monk named St. Hugh of Lincoln went over to England and founded a monastery in Somerset.

Charybdis, see SCYLLA AND CHARYBDIS.

Chase, John (1810-79), Eng. water-colour painter, *b.* in London; was a pupil of Constable. One of his best-known works is of the interior of Westminster Abbey.

Chase, Salmon Portland (1808-73), Amer. lawyer and statesman, *b.* at Cornish, New Hampshire. In 1830 he settled in Cincinnati, where he won a great reputation as counsel for sev. fugitive slaves whose cause he enthusiastically upheld. On account of the question of slavery he left the Whig party in 1841. He was the first Republican governor of Ohio, which position he held from 1855 to 1859, but was unsuccessful as Republican candidate in the presidential election of 1860. From 1861 to 1864 he was secretary of the treasury, managing the country's finances with the greatest ability and credit during the years of the Civil war. The estab. of a national banking system and the issue of treasury notes ('greenbacks') were two of his most successful measures. In 1864 Lincoln appointed him chief justice of the U.S.A., in which capacity he presided at the trial of President Andrew Johnson, 1868. See A. B. Hart, *Salmon Portland Chase*, 1899; and J. W. Schuckers, *Life and Public Services of S. P. Chase*, 1874.

Chase, Samuel (1741-1811) Amer. jurist, *b.* in Maryland; admitted to the Bar at Annapolis. Was a member of the Continental Congress and was sent with Franklin to win over Canada to the revolting colonies; he signed the Declaration of Independence and helped to draw up a constitution for Indiana. An ardent Federalist, he was made a justice of the Supreme Court. Impeached by the House of Representatives, 1804, the impeachment fell through. See *Trial of Samuel Chase* (Washington, 1805).

Chase, William Merritt (1849-1916), Amer. painter, *b.* at Franklin, Indiana. He was a pupil of B. F. Hays of Indianapolis and of J. O. Eaton in New York, and later of Piloty and A. Wagner in Munich. He taught painting in New York for some years. He was a most successful portrait painter, his pictures of Whistler, Duveneck, Gen. Webb, etc., being well known. He was president of the Society of Amer. Artists.

Chasidim, see ASSIDEANS.

Chasing (Lat. *cælatura*; It. *ceselatura*; Ger. *Ciselieren*; Fr. *ciselure*), signifying chiselling. The art of producing figures and various ornamental designs, which can be either raised or hollowed on metallic surfaces with steel implements. It is employed chiefly for the ornamentation of goldsmith and silversmith articles, electro-plate, etc., being used to create flutings and bosses; it is also used to imitate engraved surfaces. Very delicate results may be achieved by this method, the most perfect examples of which may be seen in the chasing on the watch-cases by G. M. Moser, 1704-83. The worker first outlines the design on the surface he wishes to ornament; then, should bold and high embossments be the desired effect, these are blocked out by a process called snarling. The snarling iron is a long iron tool turned up at the end, and made so that when it is securely fixed in a vice, the end that is turned up can easily reach and press against any part of the inside of the article that is to be chased. The part of the article to be embossed is held firmly against the upturned end of the snarling iron, then a strong blow is given by the worker at the opposite end of the iron, with the result that the point touching the object gives it the sudden stroke that is needed to throw up the surface of the metal just where it meets the tool. When the blocking-out process from the interior is accomplished, or when the process of C. instead of embossing is required, the object to be chased is filled with molten pitch, which is allowed to harden. When this has taken place, it is then fastened to a sand-bag, and all the details of the design—lined, smooth, or rough—are worked out by a hammer and sev. small punches of varying outlines.

Chasles, Michel (1793-1880), Fr. mathematician, *b.* at Epernon, was prof. at the Ecole Polytechnique and later at the Sorbonne. He received the Copley medal from the Royal Society, 1863. In 1867 he made a report to the Academy that he had obtained a number of letters of Pascal which proved that he had anticipated the discoveries of Isaac Newton. These letters, as well as thousands of others alleged to be of Dante, Shakespeare, and other famous men, were proved to be forgeries committed by one Vrain Lucas, who was duly convicted. In his chief work, *Aperçu historique*, etc. (1837), he gives a brilliant account of the progress in modern times of geometrical methods. Other works are *Traité de géométrie supérieure* (1852); *Traité des sections coniques* (1865), etc.

Chasles, Victor Euphémien Philarète (1798-1873), Fr. writer and critic, *b.* at Malnevilliers near Chartres. His father was a member of the National Convention, and voted for the death of Louis XVI. C. was brought up in accordance with Rousseau's theory in *Emile*, and learned the printing trade. He was imprisoned for his share in a Jacobite plot, 1815, and on his release went to England, where he worked for Valpy the printer and pub. critical articles in the reviews. On his return to France he did much in introducing Eng., Russian, and Scandinavian literature. He was made librarian of the Bibliothèque Mazarin in 1837; and in 1841 he became prof. of comparative literature at the Collège de France. He *d.* at Venice. Some of his voluminous literary and critical works are pub. in *Trente Ans de critique*, twenty vols. of studies in comparative literature. 1846-1875.

Chassé, David Hendrik, Baron (1765-1849), Fr. general. He served with the Fr. Army after 1793 and during the Peninsular war; in 1815 with the Dutch at Waterloo. In 1830 he was governor of Antwerp and conducted a brave defence against the Fr. He was named by his soldiers 'General Bayonet,' from his devotion to that weapon in attack.

Chasseloup-Laubau, François, Marquis de (1754-1833), Fr. officer of engineers. Was a divisional general under Napoleon in 1799, but, later, he went over to the Bourbons and was made a Fr. peer. Was an expert in fortifications and on warfare generally.

Chassepot, Antoine Alphonse (1833-95), Fr. inventor of the rifle known by his name. He was *b.* at Mutzig, and was a mechanic in the gov. arsenal. The Chassepot was a breech-loading rifle, calibre .433 in., muzzle velocity 1328 f.s., sighted to 1200 metres. It was adopted by the Fr. Army, 1866, and was most successful in the Franco-It. war, 1867. The Prussian needle gun was matched against the Chassepot in the war of 1870. The Gras rifle replaced the Chassepot in 1874. C. received the cross of the Legion of Honour.

Chassériau, Théodore (1819-56), Fr. painter, *b.* at Samana, Santo Domingo. He was a pupil of Ingres, and subsequently studied in Rome. He was influenced by Delacroix. His 'Tepidarium at Pompeii' is in the Louvre. His frescoes at the Cour des Comptes, Paris, were partly ruined in the Paris Commune. He was well known as a portrait painter.

Chasseurs (Fr. for huntsmen, *cf.* Ger. *jäger*). In the eighteenth century the name was given to soldiers who formed a light company of skirmishers attached to a regiment; in the modern Fr. Army it is used of a class of light regiments capable of rapid movement. They are both mounted (*C. à cheval*) and on foot (*C. à pied*). The *C. d'Afrique*, first organised in 1831 and stationed in Algeria, are famous for their speed and endurance, and for their Arab horses. The *C. Alpins* are regiments of infantry stationed

on the S.E. frontier of France, and are trained to cover 37½ m. of mt. ground in a day in full marching order. In the seven months of snow they are trained to use ski and snow-shoes.

Chastelard, Pierre de Boscosel de (1540-1563), Fr. poet, born in Dauphiné. He was a descendant of the family of the Chevalier Bayard, and became a page in the household of the Constable Montmorency and of Marshal Damville. In 1561 he accompanied the latter to Scotland in the suite of Mary Queen of Scots, with whom he fell violently in love. He came a second time to Scotland with Ronsard's poem, *Les Regrets*, and recommendations from Montmorency. Entering the queen's service, he wrote passionate poems to her, and if she did not encourage him, she at least accepted his verses. He was found under her bed by her maids of honour, but was forgiven. A second offence was unpardonable, and he was hanged. According to Brantôme he went to his death reciting Ronsard's hymn to death. His last words, addressed to the queen in Holyrood, 'Adieu, toi si belle et si cruelle, qui me tues et qui je ne puis cesser d'aimer,' have often been quoted. He is the subject of Swinburne's *Chastelard* (1865) the first of his Scottish trilogy written after the Elizabethan model.

Chastellain, Georges (1404-75), Burgundian or Flemish poet and chronicler, *b.* near Alost, Flanders. Celebrated as the author of the *Grande Chronique des ducs de Bourgogne* and similar chronicles. His other works include *Douze Dames de rhétorique*, *Épithèmes d'Hector et d'Achille*, and a number of rondeaux and ballades.

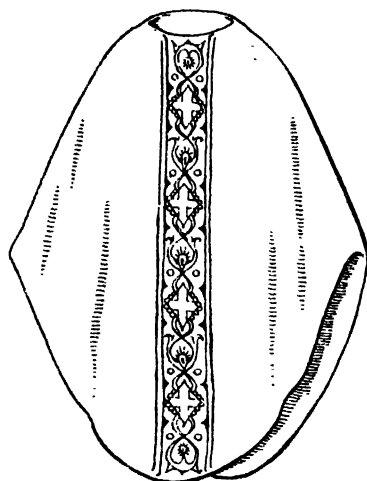
Chastellux, François Jean (1734-88), Fr. author and general, *b.* in Paris. He served with honour during the Seven Years war, and fought in the Amer. war of Independence. His best-known works were *De la félicité publique* (1772); and *Voyages dans l'Amérique septentrionale* (1764).

Chasuble, eccles. vestment, worn by bishops and priests of the Rom. Church during the celebration of mass, formerly known as *planeta*. Originally the C. fell below the knees; it became gradually modified till in the sixteenth century it reached its present form, that of a sleeveless vestment, open at the sides and covering the chest and back. The C. was formerly plain, but it is now frequently embroidered and adorned with orphreys. It must be of silk. An exquisite example of sixteenth-century It. work may be seen in the Victoria and Albert Museum, S. Kensington. The C. owes its origin to the Rom. *paenula*, a cloak worn by both sexes and all classes. Though specially a clerical garment it had no special significance in early church use, and it was first definitely reserved as a eucharistic vestment in the eleventh century, and was formally assigned to the celebrating priest in the thirteenth century as the special mass vestment. The C. was abolished by the Eng. Church after the Reformation, with the other mass vestments. (*See* illustration, p. 512.)

Chat, popular name for birds belonging

to the genera *Saxicola* and *Pratincola*, both of which are included in the Turdidae, or thrush family. *S. oenanthe*, the wheatear, *P. rubicola*, the stonechat, and *P. rubetra*, the whinchat, are all birds to which the term is applied. They are lively, insectivorous creatures, dwelling in N. lands and nesting in stony places.

Chata, or *Pterocles alchata*, representative member of the Pteroclidæ, or sandgrouse family. It is a desert bird living in S. Europe, Africa, and Asia, and is considered to be good eating.



CHASUBLE

Chatalia, tn. of European Turkey, 25 m. N.W. by W. of Istanbul. To the eastward are the Heights of C., upon which are extensive fortifications. C. was the scene of much heavy fighting between the Bulgarian and Turkish forces in the Balkan war (q.v.) of 1912 and 1913. Here, too, during Nov., occurred the heavy mortality from cholera among the Turkish troops. This outbreak commenced about Nov. 7, and during the height of the epidemic about 1000 fresh cases were reported each day. It was also at C. that the *pourparlers* took place which led up to the truce in the war. The delegates of the Balkan allies and Turkey first met on Nov. 25, and on Dec. 3 all the parties, with the exception of Greece, signed the armistice. During this armistice, which lasted till the end of Jan. 1913, the delegates of the belligerent countries met in London. The C. lines were most strengthened in the First World War.

Château, Fr. word (from Lat. *castellum*, fortress) for a castle (q.v.). During the late fifteenth and sixteenth centuries, when houses began to be built for residence only and not as castles for defensive

purposes, the term became applied to all large country houses. The fortified castle was termed *C. fort*, and the residence *C. de plaisance*; the latter often retained some, at least, of the architectural features, *lourvelles* etc., of the medieval castle of defence.

Chateaubriand, François René, Vicomte de (1768-1848), prin. Fr. writer under the First Empire, was b. at St. Malo, and after a somewhat unhappy childhood, entered the regiment of Navarre. In 1791, inspired by a desire for adventure and the natural life, he went to America, but was recalled by the news of the arrest of Louis XVI. He married immediately on his return, and then joined the ranks of the 'émigrants.' After being wounded at the siege of Thionville, he visited England, where he managed to secure a livelihood by giving Fr. lessons. In 1797 he pub. his *Essai historique, politique et moral sur les révolutions anciennes et modernes*, etc., a confused work marked by much ill-digested learning. It is sceptical and despairing, and its very uneasiness prepares one for the conversion which the deaths of his mother and sister brought about. This conversion led to his great apology for Christianity in poetry. In 1801, *Atala*, an episode detached from the greater work, was pub. It showed a new, daring, and brilliant writer, a reformer both in prose and in poetry. In 1802 appeared *Le Génie du christianisme*. The writer does not attempt directly to prove that Christianity is true, but that it is beautiful, and that it is capable of inspiring far higher poetry than is the pagan mythology. His romanticism appears in a more concentrated form in *René* (1805), another episode detached from the main work. On his return to France, C. received an appointment under Napoleon, and in 1809 pub. *Les Martyrs*, which contains the argument of *Le Génie du christianisme* cast in an objective form. Two years later he pub. *L'itinéraire de Paris à Jérusalem*, after a pilgrimage to the latter tn. C. is, with Mme de Staël, the leader of the Romantic movement of the early nineteenth century. He reformed poetry, hist., the novel, and in addition to this he was one of the greatest masters of Fr. prose. See C. A. Sainte-Beuve, *Chateaubriand et son groupe littéraire sous l'Empire*, 1860; E. Faguet, *Le XIX. Siècle*, 1887; M. H. Miller, *Chateaubriand and English Literature*, 1925; A. Maurois, *Chateaubriand*, 1938.

Châteaubriant, tn. in the dept. of Loire-Inférieure, France, situated on the R. Chère. It is a centre of importance on the State and Orleans railway routes, where the manuf. of leather and agric. implements is carried on. It is named after a castle founded in the eleventh century by Briant, count of Penthièvre, parts of which are still in existence. It is the seat of a sub-prefect, and possesses a tribunal of first instance. Pop. 8000.

Châteaudun, anct. picturesque tn. in the dept. of Eure-et-Loir, France, with 6700 inhab. It was a Gallic tn. in Rom. times and was destroyed by the Normans in 875. The tower of the castle is of the

twelfth century, the church of St. John of the eleventh; that of St. Valerian of the thirteenth and earlier; the abbey church of the twelfth-thirteenth. The abbey buildings are occupied by the hospital and law courts. C. resisted the Gers. heroically in 1870, and was pillaged and burnt by them. It bears the Legion of Honour in its arms.

Château Gaillard, ruined Fr. fortress on the Seine, not far from Les Andelys. Built at the close of the twelfth century by Richard Cœur de Lion to defend the dukedom of Normandy against the Fr. king. Captured by Philippe Auguste in 1204.

Château-Gontier, tn., dept. Mayenne, France. It is said that a castle was built here by Gunther in the eleventh century. It possesses chalybeate springs not far from the tn. There is wool and cotton spinning, and the manuf. of oil, flannel, and serge. There is also an agric. market. Pop. 6000.

Château-Renault, François Louis de Rousset, Marquis de, (1637-1716), Fr. vice-admiral, who fought at the battle of the Dunes, and, with Turenne, at the siege of Dunkirk. Fought the Levantine corsairs and captured a number of their vessels. Was made governor of Brittany and a marshal of France. Became baron of Poulmic and vicomte of Artolais.

Châteauroux, cap. of the Fr. dept. of Indre and situated on the R. Indre. The anct. quarter of the tn. lies close to the riv., and round this centre a newer quarter has now sprung up. Its name is derived from a castle built in the tenth century by Raoul of Déols. This castle, called Château-Raoul, and the modern Gothic church of St. André, form the prin. buildings of the tn. It has textile, machinery, and furniture manufs. Pop. 34,600.

Château-Thierry, tn. in the dept. of Aisne, on the Marne, France. It was here that La Fontaine was born in 1621 and his dwelling-house still stands in the street that was named after him. Not far from C. the Russians and Prussians were defeated by Napoleon in 1814. C. fell to the Gers. in their advance on Paris in Aug. 1914, when endeavouring by their southward sweep to envelop the Fr. left wing and cut off the Brit. force from all contact with the Fr. The Gers. were brought to a halt on a line about 15 m. S. of C. and when the Anglo-Fr. army counter-attacked in early Sept. 1914 desperate fighting took place at C. which had been selected as the point at which the Marne was to be crossed. It was, in fact, crossed on Sept. 8 and C. did not see any more fighting until the final Ger. advance in 1918. By March 1918 the Gers. had reached a line just N. of the R. Aisne. During their drive from here to the Marne, the Gers. encountered the 2nd U.S. Div. Four Amer. regiments of the regular infantry reached Meaux on May 30, 1918. They took over the line from the weary Fr., and the next day began the fight for C. They defeated the Gers. N.W. of that tn. and prevented them from crossing the Marne. Six

Amer. divs. stayed the final offensive of the Gers. and the tn. of C. itself was recovered from the enemy on July 21, as part of the general allied counter-offensive. Up to that date it was the most serious engagement in which the Amers. had taken part and was considered as a test of their stamina. Occupied by the Gers. 1940-44, and recaptured by Amer. troops on Aug. 28, 1944. Its industries are the making of pottery and cloth, and trade is carried on extensively in the white wine of the country, also in cattle, sheep, and agric. products. Pop. 8000.

Chatel, Ferdinand Toussaint François (1795-1857), b. at Gannat, Allier. He was a religious reformer and separated from the Catholic Church, founding a new communion, the Gallic Church. He denounced celibacy and private confession, and wrote many religious essays.

Châtelaine, Fr. term for the mistress of a castle; she carried the keys of the castle suspended from her girdle, and thus the term is used of a collection of small chains with useful small articles, such as keys, penknife, scissors, thimble, etc., attached to the ends, fitted with a clasp and worn at the belt.

Châtelet, tn., Hainaut, Belgium, on R. Sambre. It is a mining centre, and manufs. explosives. Pop. 14,000.

Châtelet, Le Grand, old fortress on the r. b. of the Seine in Paris, on the site now occupied by the Place du C. The first mention of it is in a charter of Louis le Jeune, 1147. It was the city prison in the time of the Renaissance, and a court of justice, but was destroyed in 1802. Le Petit C., a smaller fortress on the opposite bank of the riv., also used as a prison, was destroyed in 1782.

Châtelet-Lomont, Gabrielle Emilie le Tonnelier de Breteuil, Marquise du (1706-1749), b. in Paris. She was the beautiful daughter of the Baron de Breteuil, and married the marquis du C. in 1725. Her fame is due to her intimacy with Voltaire who, attracted by her cleverness and beauty, took up his abode with her at the Château of Cirey in 1735. Many accounts of the life at Cirey have been written, the best known being those of Mme de Graigny, who credits the fair Emilie with a very bad temper and describes her quarrels with Voltaire with considerable humour. She seems to have tired of him eventually, and in 1747 turned her attention to Saint-Lambert, an officer in the guard of King Stanislaus. She pub. sev. works and translations, and in conjunction with Voltaire wrote a treatise on the Newtonian system.

Châtellineau, tn. of Hainaut, Belgium, situated on the R. Sambre, 27 m. E. of Mons; it is a mining tn. with big coal-fields and iron works. Pop. 17,000.

Châtellerault, tn. in the Fr. dept. of Vienne, 40 m. S. of Tours. It is not of much interest, the prin. industry being the manuf. of cutlery; it has also a gov. small-arms factory. A fine stone bridge connects the tn. with a suburb on the other side of the riv. Pop. 22,800.

Chatfield, Sir Alfred Ernie Montacute Chatfield, first Baron (b. 1873), Eng. admiral, son of Adm. A. J. C. Entered navy, 1886; captain, 1909; rear-admiral, 1920; vice-admiral, 1926; admiral of the fleet, 1935. Served as flag-captain to Sir David Beatty, H.M.S. *Lion*, in action off Hellgoland, 1914; Dogger Bank, 1915; battle of Jutland, 1916. Fourth sea lord, 1919; assistant chief of naval staff, 1920-22; commanded light cruiser squadron, 1923-24; third sea lord and controller of the navy, 1925-28; commander-in-chief of Atlantic fleet, 1929-30, of Mediterranean fleet, 1930-32; first sea lord and chief of the naval staff, 1933-38; chairman of expert committee on Indian defence, 1938-39; minister for co-ordination of defence, 1939-40, with seat in the War Cabinet. K.C.B., 1922; G.C.B., 1934; O.M., 1939. In the inter-world-war decades he held key posts which placed him in a position to warn the gov. and the people of the risk that the country might once again find itself facing a world war without being prepared. As assistant chief of the naval staff he attended the Washington Conference of 1921-22 (q.v.) as expert adviser to the Brit. delegation, being instrumental in securing such concessions on battleship tonnage as enabled the Admiralty to build two new 16-in.-gun ships. Played a prominent part in designing *Nelson* and *Rodney*. As controller of the navy he served at a time when the efficiency of the navy was dangerously impaired by false economy; by the short-sighted Ten Year Rule or empirical assumption that no major war could recur for ten years, a period probably justified as at 1919 but not if it were renewed at the end of each year of peace; and by the cuts of the Colwyn Committee on Estimates. None fought harder than C. for naval efficiency at a time when the 'super-domination of Britain's defences given to the Treasury and successive chancellors by the gov. was bringing the defences of the empire to a state that became a public scandal'—though it should be borne in mind that, apart from the financial stringency of the inter-war period, it was sincerely believed by many, both politicians and experts, that the capital ship, for which C. argued, was outmoded by the bomber. That belief, however, was at the time unsupported by any direct evidence. In the struggle for new cruisers in 1925 following the Washington Conference C. had to contend against the neutral or hostile attitude of both press and Parliament, but in the event the gov. gave way because the case against C. and the Admiralty was indefensible. In 1930, however, at the time of the London conference (q.v.) other counsels prevailed, which 'led the sea-security of the empire to its most dangerous point for 150 years.' When, in 1933, C. was once more appointed to the Admiralty, he aimed at three objectives: to rebuild the battle fleet; to increase Brit. cruiser strength to a minimum of seventy; and to free the Fleet Air Arm (q.v.) from Air Ministry control; and generally he was successful.

At the time of the fourth naval conference his long struggle with America over cruiser-parity came to its natural end by mutual goodwill, but only after the dispute had lasted ten years. Equally tenacious was his stand, at this latter conference, on the question of the rebuilding of the battle fleet. As chief of the naval staff he set as the basic aim the unity of the three services and, through that unity, the strengthening of the chiefs of staff committee in their task of rebuilding the fighting services, which, by 1933, had been reduced to 'such a serious state of unreadiness for war.' C. succeeded Lord Caldecote (then Sir Thomas Inskip) as minister for the co-ordination of defence, with a seat in the Cabinet, the appointment being hailed with enthusiasm by public opinion. As deputy chairman of the committee of imperial defence (q.v.) he deputised for the Prime Minister on all ordinary occasions. Publications: *The Navy and Defence* (1942); *Defence after the War* (1944); *It Might Happen Again* (written in 1940) pub. 1947 (autobiographical).

Chatham, riv.-port tn. in Kent, situated on the r. b. of the Medway, and joined on the W. side by Rochester, and the E. by Gillingham. The tn. possesses very few objects of interest, and owes most of its importance to its military fortifications and dockyards. It is one of the most celebrated shipbuilding centres in England, the length of the dockyards being nearly two m., which contain sev. building slips and wet docks, the latter capable of holding the largest ships. In the Middle Ages C. was merely a suburb of Rochester, but Henry VIII., to whom we owe the foundation of a regular navy, estab. dockyards, and the natural harbour formed by the deep channel of the riv. was made use of by Elizabeth, who built a dockyard and an arsenal here. The defences of C. constitute a fortification of great strength, and are a great protection to London should invaders succeed in landing on the S. coast, in order to march on the cap. Fort Pitt, rising above the tn. to the W., built in 1779, is utilised as the general military hospital. There is a large convict estab.; also an almshouse built in 1592 by Sir John Hawkins for disabled seamen, which has since those days been entirely rebuilt. At one time traces of old Rom. remains were discovered in the form of weapons, Rom. bricks, and tiles; also human remains. The modern church of St. Mary's, opened in 1903, stands on the site of an old Saxon church. There is also St. Bartholomew's Chapel, which was formerly attached to the hospital for lepers, one of the first founded in England, by Gundulph, bishop of Rochester, 1070, partly of Norman architecture. In 1905 King Edward VII. unveiled a memorial arch in memory of the Royal Engineers who fell in the S. African war. The Naval War Memorial was unveiled by the Prince of Wales in 1924, and that of the Royal Engineers by the duke of Connaught in 1922. Pop. 45,000. With Rochester and Gillingham C. forms a parl. bor. returning two members.

Chatham, also called **Miramichi**, tn. in Northumberland co., New Brunswick, Canada, a port on the Miramichi R., 24 m. from its mouth. Extensive fisheries are carried on, also a trade in lumber. Pop. 5000.

Chatham, co. tn. of Kent Co., Ontario, Canada, on the Thames R. 12 m. from its mouth, 64 m. S.W. of London and 180 m. W. of Toronto. Connected with Detroit and the cities on Lakes Huron and Erie by steamboat service. It is the centre of a large natural gas field, and has also cheap hydro-electric power. The chief industrial products are motor cars, pumping and well machinery, textiles, malleable steel, flour, lumber, sugar, cigars, furnaces, gloves, and fertilizers. The crops of the co. are husking corn, tobacco, tomatoes, and soy-beans. C. has two large parks and four more on the nearby lakes. There are two business colleges, a new collegiate institute or senior high school, and a vocational school; also there are two hospitals. The community was first surveyed in 1794 by Governor Simcoe, as a naval shipyard; hence its name. It became a city in 1895. It was famous in pre-Amer. civil war days as the N. terminus of the 'underground railway' for escaped negro slaves. Pop. 18,000.

Chatham, **William Pitt**, first Earl of (1708-78), statesman, was educated at Eton and Trinity College, Cambridge, and early in 1731 was gazetted cornet in Lord Cobham's Horse. Four years later he entered Parliament as member for the family bor. of Old Sarum. He supported the Opposition, and for a speech made on the marriage of Frederick, Prince of Wales, which the king found offensive, he was dismissed from the army (1736). Shortly after, the prince rewarded his supporter by making him one of his grooms of the bedchamber. Pitt soon took an active part in the debates of the House of Commons, and his great powers of oratory within a short time marked him out for future distinction. He had, however, to contend against the king's dislike, which blocked his progress for a long time. Under Pelham he was appointed early in 1746 joint vice-treasurer of Ireland, but in May of the same year he was promoted to the position of paymaster-general of the forces. This was the most lucrative office in the ministry, owing to the numerous and valuable perquisites attaching thereto; but Pitt, to his great credit, declined to accept anything but the actual salary. On Pelham's death, Pitt hoped to lead the House of Commons, and, disappointed in his ambition, he attacked the new leader, Sir Thomas Robinson, and the new Prime Minister, the duke of Newcastle. He was dismissed late in 1755, but a year later he was invited to form an administration. In April 1757, dismissed by the king, whose dislike of him was even stronger than before, he was, after a few weeks, recalled to power, and held office (under the nominal leadership of the duke of Newcastle) until Oct. 1761. It was during this period that he was able to give the fullest

proofs of his ability as a war minister, for he had returned with full powers to direct the war and to take charge of foreign affairs. He declined office in 1763, but continued to take as active a part in debate as his health would allow. When Rockingham was dismissed in July 1766, Pitt was invited to form another administration, but he was not well enough to do more than take the sinecure office of Lord Privy Seal in his own ministry. This necessitated his accepting a peerage—a step that made him for a time very unpopular. The city especially resented the 'Great Commoner' becoming the earl



EARL OF CHATHAM

Engraving after a picture by Richard Brompton

of C., and actually cancelled a banquet that was to have been given in his honour. His health now completely gave way, and he resigned the office of Prime Minister in Dec. 1767 to the duke of Grafton, holding, however, that of Lord Privy Seal until the Oct. of the following year. He was taken ill while making a vigorous speech in the House of Lords against the acknowledgment of Amer. independence (albeit he had never approved the war) on April 7, 1778. He died at Hayes on May 11, and was buried in Westminster Abbey on June 9. C. is one of the greatest figures among Eng. statesmen, and he stands for all time as one of the greatest parliamentors of this or any other country. His popularity throughout the kingdom was enormous, and it was due not more to a general appreciation of his abilities than to his fearlessness and his well-deserved reputation for integrity and self-disinterestedness. There are biographies by F. Thackeray (1827), A. von Ruville (1905), and B. Tunstall (1939). See also Sir C. Grant Robertson, *Chatham and the British Empire*, 1940.

Chatham Chest, charitable fund originated by Sir Francis Drake and Sir John Hawkins in 1588 to assist sick and wounded seamen. It takes its name from the money having been placed in a chest kept at Chatham that had five locks, the keys of which were held by the officers who had charge of it. Four supervisors and seven directors were appointed to look after the accounts, which had to be placed before Parliament every year. Twelve ac. of land were assigned to the charity by Charles II., and the fines imposed by the courts martial were also handed over to it in 1688. In 1802 the chest was moved to Greenwich and the fund incorporated with Greenwich Hospital; up till 1829 a considerable part of the money was raised by deductions from seamen's pay.

Chatham Islands, small group of is., including some rocky islets, in the Pacific Ocean, lying 360 m. E. of New Zealand, to which they belong. These is. were discovered in 1791 by Lieut. W. R. Broughton, who named them after the boat which he was commanding at the time of the discovery. The natives he called *Maori*, after the name which the New Zealand natives gave themselves (*see* MAORIS) and their dress consisted of sealskins or mats. In 1831 they were conquered by 800 Maoris from New Zealand, and in 1849 there were only ninety survivors out of a total pop. of 1200, the race being therefore all but exterminated. The chief export of the is. is wool, and the industries comprise cattle- and sheep-breeding, and seal-fishing. The climate is colder than that of New Zealand, while the soil is extremely fertile, with luxuriant growth of fern and fax. Area, 372 sq. m. Pop. 700 (300 Maoris).

Châtillon-sur-Seine, tn. in the dept. of Côte-d'Or, France, situated on both banks of the Seine. The industries consist of brewing and iron-founding, and trade is chiefly in wood, charcoal, and stone. There are many old houses of interest in the tn. Pop. 4700.

Chat Moss, peat bog in Lancashire, England. It lies between Manchester and Liverpool, and stretches over about 6000 ac. One of the finest feats of engineering accomplished by George Stephenson was the railway that he built across it (1828-30). Many attempts have been made to drain it, works being constructed for the purpose by Roscoe in 1805, and by Edward Baines in 1821; the greater part of it is now cultivated.

Chatou, tn. of France in the dept. of Seine-et-Oise and the arron. of Versailles, on the R. Seine. It is 3 m. E. of Saint-Germain, and 8 m. from Paris. Pop. 12,000.

Chatra, or Chiltara, tn. of Brit. India, in the dist. of Hazaribagh. Pop. 11,000.

Chatsworth, vil. in Derbyshire, England, containing the famous seat of the dukes of Devonshire. The original C. House was commenced by Sir Wm. Cavendish (d. 1557) and completed by his widow. It was in this building that Mary Queen of Scots was imprisoned under the care of

the earl of Shrewsbury. Later it was pulled down and the present house was built in 1688 by Wm., first duke of Devonshire. It is a quadrangular building with an open courtyard in the centre, and Ionic in style, standing on the l. b. of the R. Derwent about 2½ m. from Bakewell. The magnificent gardens with the vast conservatory and numerous fountains were designed by Sir Joseph Paxton. The house contains priceless collections of pictures and statuary, and some very beautiful wood carving.

Chattahoochee, riv. in Georgia, U.S.A., forming part of the boundary on the W., and joining the Flint, after which it becomes the Appalachicola. It is navigable for about 200 m., up to Columbus, the total length being 500 m.

Chattanooga, cap. of Hamilton co., Tennessee, U.S.A., on the Tennessee R. It is important as a commercial and railway centre, doing a large trade in lumber, grain, and coal, and manufacturing iron, steel, machinery, etc. It is famous for the battle fought there during the Amer. Civil war, which consisted of a series of engagements including that of Lookout Mt., known as the 'battle above the clouds,' and that of Missionary Ridge, when the Federals under Grant defeated the Confederates under Bragg, Nov. 23 to 25, 1863. The national cemetery to the E. of the city contains the graves of over 13,000 Federal soldiers. The city contains some fine buildings, and possesses a univ. known until June 1907 as the Grant Univ. This, the univ. of C. (Methodist Episcopal), was founded in 1867 and now comprises schools of law, medicine, and theology. It has about 2900 students. Pop. 128,000.

Chattels (O.F. *châtel* from Low or late Lat. *capitale*, Lat. *capitale*, 'property,' as also 'cattle,' which is essentially the same word as chattel, but the latter is much more modern), the phrase goods and C. in Eng. law means all property not included under one or other of the terms 'lands, tenements, and hereditaments' (*q.v.*), and is thus the equivalent of personality. This property is divided into C.-real and C.-personal. The former include any estate or interest in lands or buildings which does not amount to a freehold, this inclusion being based on the fundamental principle of Eng. real property law that a term of years of any length whatsoever is no more than personal property, and descends as such on intestacy. The latter are either corporeal, *i.e.* having an actual physical existence, such as money, plate, furniture, and minerals when severed from the land; or incorporeal, *i.e.* having a mere notional existence, such as debts, patents, stocks and shares, and copyrights.

Chatterer, in ornithology, is a word that has been applied in a loose sense to many birds without special regard to its applicability. It is often used particularly for *Ampelis garrulus*, the waxwing, but is frequently used for other passeriform birds which are members of the family Cotingidae.

Chatteris, mkt. tn. in Cambridgeshire, England, situated in the administrative co. of the Isle of Ely. A thousand Rom. coins of 305-6 and part of the skeleton of an elephant have been found here. There are remains of a Benedictine convent of the tenth century. Pop. 5000.

Chatterton, Edward Keble (1878-1945), Eng. author and journalist, b. at Sheffield and educated at Oxford. Entered journalism in London in 1902 and, for a time, took up art criticism, publishing *T. Sydney Cooper, R.A.* (1903) and *Modern Journalism* (1909). But he was chiefly known as a copious writer on ships and the sea. His book *Sailing Ships: the Story of their Development from Earliest Times to the Present Day* appeared in 1909, *Steamships and their Story* in 1910, and also in 1910 *Down Channel in 'Virelle'*, on his yachting experiences. Other books were *The Story of the British Navy* (1911); *King's Cutlers and Smugglers* (1912); and, after an interval of employment in the historical section of the committee of imperial defence, *Q-Ships and their Story* (1922); *The Epic of Dunkirk* (1940); and *Beating the U-Boats* (1943).

Chatterton, Thomas (1752-70), poet, was b. at Bristol, the son of a poor schoolmaster. He is said to have been a dull child, but after he entered Colston's Hospital at Bristol at the age of eight, his faculties seem to have awakened. He began to draw, and he became an omnivorous reader, his tastes inclining to poetry. At the age of twelve he wrote a poem, *Elinoure and Juga*, on old parchment and with obsolete spelling, which deceived the junior usher of the school, Thomas Phillips, who was convinced of its antiquity. Thus encouraged, he continued what was to him a delightful game, and forged a pedigree of the De Berghams, which was accepted by their descendant, a pewterer named Henry Burgum. In 1767 he was apprenticed to an attorney at Bristol, and in the following year hoaxed that whole city with a description, alleged to be from an old MS., of the opening of Bristol Bridge in 1248. He now carried the joke further. He sent to Horace Walpole a 'transcript' of *The Ituse of Peyneleyne in England*, written by T. Rowley, 1469, for *Maistre Canynge*. Walpole was deceived, and had some thought of printing them at his own press, but before doing so showed them to Gray and Mason, who pronounced them forgeries. Whereupon Walpole returned the MS. to the lad. C. came to London in 1770, and, living in a garret, wrote many verses, including the *Excellent Balade of Charitie*. He seemed to have a fair prospect of making his way, for Alderman Beckford became his patron; but Beckford d. on June 21, and he could find no publisher or editor to employ him. Rendered desperate by his penniless condition, on Aug. 24 he poisoned himself with arsenic. That C. should have d. at the age of eighteen is one of the crying pities of literature, for what might not he have done who, at this early age, should have written the

Balade of Claritie, a poem that beyond all doubt places him in the front rank of Eng. poets? Walpole has been blamed for his treatment of C., but this is not fair. He had every right to be indignant at being imposed upon, but had he been a finer critic of poetry than he was, he would not even have been deterred by the discovery that the poems were not by 'T. Rowley' but the work of a lad still living, for the merit of the poems is not so much in the old-world manner as in the matter. There are many who might have turned a modern poem into the spelling of other days, many, indeed, who might have done so better than C., but how many have had the genius to write them? The Rowley controversy survived the author's death, but the question has been definitely settled by Prof. W. W. Skeat in his ed. of Chatterton's works, 1875. See D. Wilson, *Chatterton*, 1869; J. H. Ingram, *The True Chatterton*, 1910; E. H. W. Meyerstein, *The Life of Thomas Chatterton*, 1930; J. C. Nevill, *Thomas Chatterton*, 1948.

Chattisgarh, see CHHATTISGARH.

Chaucer, Geoffrey (c. 1340-1400), Eng. poet, b. in Thames Street, London, the son of a vintner. At about sixteen years of age he became page to Elizabeth, the wife of Lionel, duke of Clarence, and continued at court till 1359, when he joined the army which invaded France under Edward III. He was made prisoner, but ransomed some months before the treaty of Bretigny in 1360. Nothing is known of the next six years of his life, but in 1366-72 he was again connected with the court, being at one time a valet of the king's household. At the death of his patron, Prince Lionel, in 1368, his services were transferred to John of Gaunt, duke of Lancaster. It was at this time that he first began to write. For the next twelve or fourteen years C. was constantly employed as a foreign diplomatic agent. During 1372-73 he was in Italy, first visiting Genoa on a commercial mission, and later Pisa and Florence. On his return he was rewarded by the grant of sev. privileges, including, in 1374, the office of the comptroller of the customs and subsidy of wools, skins, and leather for the Port of London. In 1375 he received the custody of the lands and person of Edmond Staplekat of Kent, and in 1376 was employed upon a secret mission in conjunction with Sir John Burley. During 1377 he went to Flanders, and later to France, to treat for peace with Charles V.; in 1378 to France and Lombardy; in 1382 was appointed comptroller of the petty customs. He became a justice of the peace in Kent in 1385, and in 1386 became member of Parliament and a knight of the shire for Kent. Later in the year he was reduced to comparative poverty by being removed from both his offices of comptroller, apparently at the instigation of Thomas, duke of Gloucester. In 1387 he lost his wife, Philippa, and in 1389, on the return of his patron, John of Gaunt, from an absence abroad, was appointed clerk of the works at the palace

of Westminster and the Tower of London. In 1390 he superintended works at St. George's Chapel, Windsor, at Woolwich, and at Smithfield, but in 1391 lost his position. In 1394 Richard II. granted him a new pension of £20, and in 1398 a yearly tun of wine; and in 1399 Henry IV. promised him an additional pension of forty marks. He *d.* on Oct. 25, 1400, in a house he had recently rented in the grounds of St. Mary's Chapel, Westminster, and was buried in St. Benet's Chapel (now Poets' Corner) in Westminster Abbey.



CHAUCER

An engraving after the 'Oocleve' portrait.

The works of C. fall into three periods, named, from the main influences exhibited in them, respectively Fr., It., and Eng. During his life at court, previous to 1372, his work was entirely imitative, and based on the popular Fr. poems which would be the natural models of a young poet of the time. He himself tells us that he made a trans. of the famous romance, *Le Roman de la Rose*, but of this all trace has been lost except three fragments of doubtful authenticity except, perhaps, the first. Probably his earliest poem which remains to us is the *A B C*, a prayer rendered out of Fr. at the request of Blanche, duchess of Lancaster. To this period also belong the *Compleynt to Pite*, a poem of rejected love, possibly autobiographical, and *The Dethe of Blaunche the Duchesse*, written in 1369, to commemorate the death, at the age of twenty-nine, of the wife of his patron, John of Gaunt. The second, or It., period (1372-84) is marked throughout by a love and knowledge of It. poetry, gained during his first mission to that country. Fr. romance was thrown over as he came to learn more of the full range and power of poetry, and the work of this time shows an enormous advance in form,

simplicity and directness of diction, humour, and, above all, the art of telling a story. Parts of sev. of the *Canterbury Tales*, such as the Second Nonnes tale, the Clerkes tale, the Knightes tale, the Man of Lawes tale, the Monkes tale, the Doctors tale, the tales of the Prioress, Squire, Franklin, and the rhyme of Sir Thopas, were probably composed during this period, but the most important complete poem produced under It. influence was *Troilus and Creseide* (c. 1382), a very free trans., with many additions, of Boccaccio's *Filostrato*. The additions are excellent and full of originality, and while the passionate description of the ruined love of Troilus and Cressida may be reminiscent of the *Compleynt to Pite*, the character of Pandarus foreshadows the humour of the *Canterbury Tales*. Other poems of this period are the *Compleynt of Mars*; *Anelida and Arcite*; *The Former Age*, mainly taken from Boethius; the *Wordes to Adam*; the *Parlement of Foules*, full of delightful humour; and the *House of Fame*, an unfinished poem, showing the influence of Dante. The prose trans. of Boethius was also written at this time. The third, or Eng. period, beginning about 1381, shows C. an entirely original poet except in the subject-matter of his work, and establishes his claim to be called the father of Eng. poetry. Between 1386 and 1389 he composed many of the most characteristic of the *Canterbury Tales* and the *Prologue*, revised and completed earlier tales, and consolidated the whole work. He also wrote the *Legende of Good Women* (1385-86), which was left unfinished; the *Treatise on the Astrolabe* (1391), compiled mainly from Messahala, for his little son Lewis, and left unfinished; the *Complaint to his Purse*; and sev. minor poems of doubtful date, such as *Truth*. The *Canterbury Tales*, upon which C.'s fame chiefly rests, owe their plan to the *Decameron* of Boccaccio, in which stories are told by a band of fashionable ladies and gentlemen who had retired to a garden outside Florence to escape the plague. C. transposes the idea to contemporary Eng. life by making the tellers of his tales members of a party of pilgrims on the road from Southwark to the shrine of Thomas à Becket at Canterbury. The pilgrims include men and women of every rank of social life, and represent the church, the army, the court, law, medicine, trade, the sea, and the kitchen. The plots of their tales come from various sources. Many are foreign in origin, but much skill is shown in assigning these to suitable characters and bringing them into harmony with the general scheme by adaptation and addition. Many, such as the tales of the Miller, the Reeve, the Cook, the Wife of Bath (prologue), the Merchant, the Friar, the Nun's Priest, and the preamble of the Pardoner, are typically Eng., shrewd, good-tempered, inclined to be boisterous and full of a humour, which, if at times too broad for modern taste, is frank, hearty, and healthy. Among the numerous odes, of C.'s works may be mentioned those of

John Stowe (1561); W. W. Skeat (1894-97 and 1895); F. N. Robinson (1933). Bibliographies have been pub. by E. P. Hammond (1908), D. D. Griffith (1926), and W. E. Martin (1935). See also W. Godwin, *A Life of Geoffrey Chaucer*, 1803; G. G. Coulton, *Chaucer and his England*, 1908; E. Legouis, *Geoffrey Chaucer*, 1913; G. L. Kittredge, *Chaucer and his Poetry*, 1914; G. K. Chesterton, *Chaucer*, 1932; J. L. Jones, *Geoffrey Chaucer*, 1934; H. S. Bennett, *Chaucer and the Fifteenth Century*, 1947; and J. S. P. Tatlock and A. G. Kennedy, *A Concordance to the Complete Works of Geoffrey Chaucer and to the Romaunt of the Rose*, 1927.

Chaucer, Thomas (c. 1367-1434), Eng. statesman, supposed son of Geoffrey. He had the early patronage of the duke of Lancaster, and held sev. posts under Richard II. and Henry IV., notably that of chief butler. He had large estates in Oxfordshire, which he represented in numerous parliaments. In 1407 and in 1414 he was elected Speaker of the House of Commons. He served on sev. diplomatic missions, and in 1424 became a member of the council.

Chaucer Society, The, founded in London (1867) by F. J. Furnivall with the aim of supplying scholars with MSS. and early texts relating to Chaucer not accessible to the public generally, and of facilitating Chaucerian research, and encouraging knowledge of his works by all. Furnivall issued in 1868 a six-text print of the *Canterbury Tales* for the society, and an index of proper names and subjects has been prepared by it (1911).

Chaouai, ant. and powerful Ger. tribe, mentioned by Tacitus as a people of great nobility, who lived by the shores of the Ger. Ocean, in the dist. stretching between the Rs. Elbe and Ems.

Chaudesaigues, tn. in the dept. of Cantal, France, 19 m. S.S.W. of St. Flour. It is renowned for its hot mineral springs, which have a varying temp., and at their highest point are among the hottest in France. Pop. 1200.

Chaudet, Antoine Denis (1763-1810), Fr. sculptor, b. in Paris. After obtaining the Grand Prix he left his bp. and went to Rome in 1784, and here, influenced by the enthusiasm which prevailed in those days for the antique under Canova, he wrought his most famous works, 'Love,' 'Peace,' 'Paul and Virginia,' all of which are in the Louvre; 'Edipus' and the bas-relief 'Fine Arts' being in the Musée Napoléon. He produced also a bust of Napoleon.

Chaudfontaine, Belgian vil. charmingly situated on a hill above the R. Vesdre, 5 m. S.E. of Liège. It possesses hot mineral springs. Pop. 2100.

Chaudière, riv. and lake in Quebec, Canada. The riv. rises in the vicinity of Maine, U.S.A., flows into Lake Megantic, and from thence travels in a N.W. direction to join the St. Lawrence R., 7 m. distant from the tn. of Quebec. The C. Falls occur about 2½ m. from its mouth. The lake is 18 m. in length, and 5 m. in width. The R. Ottawa flows

through it, and the lake has its termination at its E. end in the Great and Little C. Falls, close to which lies the tn. of Ottawa.

Chaud-Medley, see CHANCE-MEDLEY.

Chaudoc, arron. of Cochín-China, on the lower arm of the R. Mekong. The country is mountainous in the W. part, and flat and marshy in other parts, and forms the plateau of Thatson, 1300 to 1600 ft. The chief products are rice, maize, vegetables, and indigo. The inhab. are composed of Malays, Chinese, Tsiams, Cambodians, and Annamites. The cap. tn., C., stands at the head of a canal which forms a connection with the riv. and the port Ha Tien.

Chaulieu, or Chaulieuc, Guillaume Amfrye, Abbé de (c. 1630-1720), Fr. poet and wit, styled the 'Anacreon of the Temple,' the coterie of which the grand prior Vendôme was the head. He was b. at Fontenay, Normandy, and educated at the Collège de Navarre. Received the abbey of Aumate and other livings from his patron Louis Joseph, duc de Vendôme. He and his friend, the marquis de la Fare (1644-1712), who were always quoted together, were the most prominent Fr. poets at the beginning of the eighteenth century, and their works were ed. together in 1714 and twice later in the same century. Both derive, on the one hand, from the artificial school of Voiture (1598-1648), who was the incarnation of the aspirations of the Hôtel de Rambouillet and, on the other, from the Bacchic sect of St. Amand. C.'s compositions were generally lyrical quatrains of the kind ridiculed by Molière, yet some are not without merit, as *La Solitude de Fontenay*, *La Goutte*, and the *Ode sur l'Inconstance*.

Chaulmoogra, E. Indian tree, *Gynocardia odorata*, of the family Flacourtiaceae. Its fruit yields a light brown oil or soft fat, acid in taste containing glycerides of lauric and linolic acids, together with the active principle gyno-cardine. This oil is used in the treatment of leprosy.

Chaumette, Pierre Gaspard (1763-94), Fr. revolutionist, son of a shoemaker at Nevers. He was for some years a seaman, and led a wandering sort of life, becoming in 1790 a student of medicine at Paris, and an orator at the club of the Cordeliers.

Chaumont, cap. of the dept. of Haute-Marne, France. A picturesque tn. situated on a height between the Rs. Marne and Suize. The chief industries are those of glove-making and leather-dressing. There is good trade in grain, leather, and iron, the latter found in the neighbourhood. It was here, in March 1814, that Great Britain, Austria, Russia, and Prussia concluded the treaty, or the Holy Alliance as it was afterwards called, against Napoleon. Pop. 15,900.

Chauncey, Isaac (1772-1840), Amer. naval commander, b. at Black Rock, Connecticut; entered the U.S. Navy as a lieutenant in 1798. Served with distinction against the Barbary pirates in Tripoli, and on the lakes during the war of 1812. Taking the command

at Sackett's Harbour in 1812, C. then a commodore, increased the strength of Amer. ships from a single vessel (the brig *Owida*) to ten ships. Later, when Sir James Yeo was sent out from England, he lost two of his schooners in a skirmish with the Eng. commander, but Yeo's resources proving inadequate, C. compelled him to give up the blockade of Sackett's Harbour. Was president of the Board of Naval Commissioners from 1833 till his death.

Chauncy, Charles (1592-1672), Eng. nonconformist divine, b. in Hertfordshire; became Gk. prof. at Cambridge, and later vicar of Ware, Hertfordshire. His religious convictions brought him into difficulties, and in 1638 he emigrated to Massachusetts. He preached for twelve years at Seltuate, and in 1654 became president of Harvard College.

Chauny, tn. in the dept. of Aisne, France, situated on the Oise and the St. Quentin canal, which at this point becomes navigable. Much fighting took place here during the Hundred Years war. Chief industries are the sugar factories, metal foundries, and breweries; there are also important chemical works. The tn. was rebuilt after its destruction by the Gers. in the First World War. Pop. 9200.

Chausey, group of small is. belonging to France, in the Eng. Channel, nearly opposite the port of Granville (cf. CHANNEL ISLANDS). The largest is about 10 m. long by 4 m. wide. Granite is quarried in large quantities during the summer months.

Chausée, Pierre Claude Nivelles de la, see LA CHAUSÉE.

Chautauqua, beautiful lake of glacial origin in the co. of Chautauqua, New York, U.S.A. 1300 ft. above sea level. Its length is about 20 m., while the greatest breadth is 2 m. It lies 10 m. away from Lake Erie, and is 700 ft. above it. On its shores stands the Chautauqua Institution, an adult school, founded by John H. Vincent and Lewis Miller in 1874, for instruction in literature, art, and science. The C. Assembly grounds, lying to the N. of the lake, cover about 165 ac., and contain about 500 cottages, a hall with seating accommodation for 5000 persons, a fine hotel, and a museum.

Chauvinism, term used for unreasonable and exaggerated patriotism and pride in one's own country, with a corresponding contempt towards other nations. It is the Fr. equivalent to the Eng. 'Jingoism'. Nicolas Chauvin was an old soldier of the republic, and well known in Paris for his devotion to the cause, his name became a synonym for the blind worship given by Frenchmen to Napoleon. Chauvin has been represented on the stage as a patriotic character by many writers, e.g. in T. and H. Cogniard's *La Cocarde tricolore*, 1831.

Chaux de Fonds, La, industrial tn. in the canton of Neuchâtel, Switzerland. Chief centre of the watchmaking industry, and has a school for the engraving and enamelling of watch-cases. Pop. 37,700.

Chavanne, Joseph (1846-1902), great Austrian traveller and geographer, who was b. at Graz. From 1867 to 1869 he

travelled in N. America, Central America, Morocco, and the Sahara; and from 1884 to 1885 he explored in the Congo.

Chavannes, Pierre Cécile Puvion de, see Puvion.

Chavasse, Francis James (1846-1928), Eng. bishop, son of Thomas C. of Sutton Coldfield. Vicar of St. Peter-le-Bailey, Oxford, 1878. Succeeded Dr. Kyle as bishop of Liverpool, 1900. The building of Liverpool Cathedral owed much to his energy and zeal.

Chaves, fort. tn., on the r. b. of the Tamega, Portugal. It has silk and linen industries, and is famous for its hot saline springs. Pop. 8800.

Chazelles, Jean Mathieu (1657-1710), Fr. mathematician, b. at Lyons, who assisted Cassini in drawing the meridian line, and in 1685 was appointed hydrographical prof. at Marseilles. Later he went to Egypt and measured the Pyramids, when he discovered that the four sides of the pyramid of Cheops answer to the cardinal points of the compass. Elected a member of the Academy of Science in 1695.

Chazelles-sur-Lyon, com. in the Loire dept. of France, 23 m. from Lyons; has felt hat factories. Pop. 5250.

Chazy, name given by Amer. geologists to the limestone found at Chazy, New York, and elsewhere in N. America.

Cheadle, mkt. tn. in Staffordshire, England, 13 m. N.E. of Stafford. There are important collieries in the neighbourhood; also manufs. of brass, copper, and tin. The silk mills and tape factory form other considerable industries. The Rom. Catholic Church of St. Giles was designed by Pugin, and erected in 1864. Pop. 6000.

Cheape, Sir John (1792-1875), Eng. general who in 1849 did admirable service in the battle of Gujrat under Lord Gough. It was due to his efforts that Pegu and Tenasserim were added to the E. India Company's possessions in 1850.

Cheapside, street in the city of London, between St. Paul's Cathedral and the Poultry. In olden times it was known as the Cheap or West Cheap and in the fourteenth century tournaments and jousts were held there. They were given by the king, and held opposite Bow Church, from a balcony of which the queen, court, and nobility used to watch the proceedings. Until 1390 there stood the Old Cross, at the W. end of Cheapside, beside which Stapleton, bishop of Exeter, was beheaded. At Wood Street stood also until 1643 the Eleanor Cross. The cross was badly damaged in the Second World War, and the church of St. Mary-le-Bow, save its Norman crypt and 221-ft.-high steeple, was destroyed.

Cheating, see FRAUD.

Cheb (formerly Eger or Erlau) tn. of Czechoslovakia on the R. Eger. The tn. was an important fortress until 1809. It is the cap. of Egerland, Bohemia, inhabited by Gers. Wallenstein was assassinated in the tn. hall (which was later converted into a museum) on Feb. 25, 1634 by an Irishman. Schiller lived in the Schillerhaus in 1791. The Gothic church of St. Nicholas dates from 1230

to 1270. Manufs. include textiles, agric. machines, and earthenware. Pop. 32,000 (Gers. 24,000). The Elger rises in the Fichtelgebirge and after flowing 190 m. joins the Elbe 30 m. N.W. of Prague. In 1939 the tn. fell to the Gers. on the invasion of Czechoslovakia.

Chebichev, Pafnuty Lvovitch (1821-94). Russian mathematician, b. at Borovsk, educated at Moscow Univ. Was a member of the Royal Society of London. Wrote treatises on the theories of prime numbers, probabilities, and integrals; on quadratic forms, gearings, etc. Came near to devising a straight-line motion—but this was only actually devised by one of his pupils. Pub. *Traité de la théorie des nombres*.

Cheboksari, cap. of the Chuvash autonomous S.S.R., Russia, near Kazan. Pop. 10,000.

Cheboygan, city in C. co. Michigan, U.S.A. It is situated in a fertile farming dist., and possesses paper and lumber mills, and tanneries. Pop. 5600.

Checoy, **Chequi**, or **Checky**, in heraldry the term signifying small squares which constitute the field or charge of a shield, or escutcheon.

Cheddar, vil. in Somerset, England, 22 m. S.W. of Bristol. Famed for the large stalactite caves which form a source of great attraction to summer visitors. The remains that have been found in these caves prove the existence of Rom. settlements at C. The beautiful rocky way which leads from the Mendip Hills down into the vil. is known as the C. Gorge. The noted C. cheese is made here and in the surrounding dist. Pop. 2000.

Cheddite, generic name of various blasting explosives consisting essentially of a chlorate incorporated with a nitro-compound dissolved in castor oil. The salt generally employed is potassium chlorate. Cs. are used in considerable quantities for blasting operations.

Cheedorlaomer (Kudur-Lagamar), king of Elam, the chief of the four kings who fought a victorious campaign against the five rebel Canaanite princes mentioned in the fourteenth chapter of Genesis. Lot was taken by the kings, but was rescued one night in an attack made by Abraham.

Cheduba, or **Man-aung**, is. in the bay of Bengal, 10 m. from Arakan. The soil is fertile, the chief crops being rice and tobacco, also cotton, indigo, and the sugar cane. The is. is noted for its good petroleum wells.

Cheera, see CHIRA.

Cheering, or **American College Yells**. There is little analogous in Eng. univs. and schools to the Amer. college 'yells' in Brit. C. or in the Fr. *chœur*, or in any other known conventional C. or form of acclamation. The yell in Amer. univs. both those of the U.S.A. and Canada, is a cry consisting of certain sounds or words agreed or fixed on to be used by the students as distinctive of the particular college or institution to which they happen to belong. The Amer. college yell is rhythmical, and though C. conducted rhythmically is familiar enough in England and elsewhere, it is generally

no more than a preconcerted rhythm with nothing of the habit or usage so characteristic of the student of W. nations. In all probability the college yell has evolved itself out of the primitive war-cry like the *houzè* or *vivat* of France, and this origin indeed is certain in the case of the yell adopted by the 'All-Blacks' or team of rugby footballers that first visited England in 1907 from New Zealand. The yell of this team was admittedly a kind of war-cry adopted from some customary cry of the Maoris. Amer. schools and colleges generally have one yell for the institution as a whole and different yells for the different classes. The oldest cheers are those of the New England colleges, Yale and Harvard, the basic element in which *rah* is really nothing more than an abbreviation of the Eng. *hurrah*. The original yells of these two leading univs. are identical in form, being simply the cry 'rah' shouted in unison nine times with the name of the univ. at the end of the repetition; but the yell of Yale is uttered more quickly than that of the great rival institution. Some institutions have sev. different yells or variants of the original yell, Yale itself favouring a cheer which runs thus:

'Brekekekex, ko-ax, ko-ax
Brekekekex, ko-ax, ko-ax
O-op, O-op, parabaloou
Yalo, Yale, Yale.
Rah, rah, rah, rah, rah, rah, rah,
rah, rah,
Yale! Yale! Yale!'

The yell of Princeton Univ. runs

'H'ray, h'ray, h'ray, tiger
Siss, boom, ah; Princeton!'

and this college also expands this into a triple cheer on occasion. The United States Naval Academy adopts a yell or cheer which is aptly enough an imitation of a nautical steam syren. The Amherst cheer is very similar to the original yells of Yale and Harvard, while the Toronto Univ. students repeat or spell the word 'varsity' sev. times and end with the stereotyped 'rah, rah, rah.' There are also besides these individualised cheers, yells or cheers common to all Amer. colleges and generally made use of in acclaiming some successful athlete or popular prof. For the most part the college yell is used at athletic contests. In most of the large colleges there are sev. leaders, elected by the students, who stand in front and call for the different songs and yells, directing the cheers with their arms in the manner of the conductor of an orchestra.

Cheese (Lat. *caseus*), preparation of milk, produced by separating the proteinous or nitrogenous substance known as casein or curd from the whey. The fatty matter in milk forms an important constituent of C., and often there is present in C. a greater percentage of fat or butter than of casein. Therefore, the finest Cs. are made from the richest milk, and the various kinds of C. on the market are as much due to the different qualities of milk in various dists., as to

the different processes of making. *C.* was known in very early times; frequent references to it occur in Gk. and Rom. authors, and the methods used in *C.*-making are described by Columella. The casein in milk is separated by acids in the case of sour milk, or by rennet prepared from the stomach of sucking calves. Fresh milk is warmed to a temp. of about 80° to 85° F., when the rennet is added in a liquid form, which causes the milk to ferment. The curd thus produced is cut across into sev. pieces. The mass is stirred for a few minutes, and then heated up to 90°-100° F. The object of the operator is to bring about the proper consistency of curd, without losing any of the fat of the butter in the whey. The whey is finally drawn off, and the curd left to settle until it becomes a firm solid. The fermenting action of the rennet continues during the period of ripening the curd. The curd is tested from time to time with a hot iron. If the development of acidity has been allowed to go too far, the curd becomes brittle and cracks easily. When the hot-iron test shows fine long flakes the curd is cut up into slabs and passed through a small grinder. Salt is now added to the substance to prevent any further development of acidity, and the substance is wrapped in cloths, and left to mellow in a cool room or cellar. The hard *Cs.*, made in the United Kingdom and in America, improve in quality by keeping. They are generally left for sev. months to ripen, and when finished are fairly hard in substance. Continental *Cs.*, on the other hand, are soft, and most of them require to be eaten when quite fresh. The chief hard *Cs.* are Cheddar, Stilton, Eng. Cheshire, Gloucester, Wiltshire, Gorgonzola, and Gruyère. The best-known soft *Cs.* are Brie, Neuchâtel, Camembert, and Limburg, and Philadelphia cream. *C.* is a very nutritious food. Well-cured *Cs.* contain about 30 per cent water to 6 per cent sugar, the rest of the contents being fat and protein. Stilton *C.*, made from rich milk, contains about 36 per cent fat and 28 per cent protein. See E. R. Ling, *A Text Book of Dairy Chemistry*, 1930; A. L. Simon, *A Catechism concerning Cheeses*, 1936; J. Squire (ed.), *Cheddar Gorge: a Book of English Cheese*, 1937; L. C. van Slyke and W. V. Price, *Cheese*, 1938.

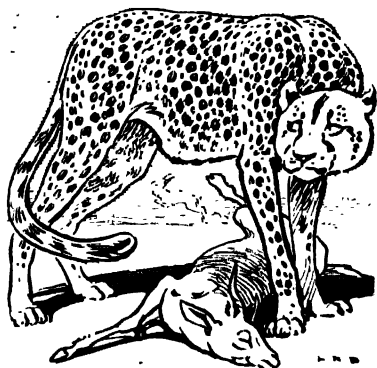
Cheese-hopper, or **Cheese-skipper**, is the larva of a small dipterous insect, *Piophilæ casei*, of the family Sepsidae.

Cheese-mite, or *Tyroglyphus siro*, is an arachnid related to many other mites which are either parasitic or live on organic matter such as carrion and plants.

Cheese-rennet, or *Galium verum*, species of Rubiaceæ allied to the cleavers (*q.v.*), and obtains its popular name from having been formerly employed to curdle milk. See also BENTLEY.

Cheetah, **Cheeta**, **Chita**, and **Hunting Leopard** are all names of *Cynaelurus jubatus*, which with the various species of *Felis*, e.g. lion, tiger, and leopard, constitute the family Felidae in the group *Æuroidea*, or cat-like carnivores. It

differs from other members of the family chiefly in having longer limbs with non-retractile, blunt claws, and the upper carnassial tooth has no inner tubercle. With such claws it is more adapted to obtaining its prey in chase, like the dog, rather than by cat-like stealth, and it is readily domesticated, again like the dog; when tamed it will purr like a huge cat. It is distributed over the whole of Africa, W. Asia, and India, and in S. India it is largely used in hunting.



Chefoo, port in the prov. of Shantung, China, with a Chinese pop. of 132,000. *C.* is noted for its large fruit-growing industry. Silk thread and twist are largely made and exported to France and America. There are many Amer. Presbyterian missionaries and the schools for the children of China Inland Mission missionaries. It is the only port that remains open through the winter, and is much frequented by invalids as a health resort in summer. The port was of considerable importance during the Russo-Jap. war.

Cheilanthes, genus of Polypodiaceæ, contains over fifty species of small but beautiful ferns. The fronds are often curved and bear small hairs. *C. fragrans* will grow in Britain under sheltered conditions.

Cheiranthus, genus of Cruciferae which contains ten species of W. and Mediterranean plants, and is represented in Britain by *C. cheiri*, the common wallflower (*q.v.*).

Cheiomancy, see PALMISTRY.

Cheiron, see CHIRON.

Cheiroptera, see BAT.

Cheirostemon Platanoides, handtree, is the single species of its genus and belongs to the Sterculiaceæ. It inhabits Mexico and will not grow in Britain. The plant is a lofty tree with the habit of a plane and a trunk the thickness of a man's body; at the head are dense branches, brownish at the tip from the short, fawn-coloured hairs that beset them. The

leaves are heart-shaped, and the bright red flowers bear stamens arranged in the form of a hand. The tree has been an object of curiosity and veneration from time immemorial.

Cheke, Sir John (1514-57), Eng. classical scholar, educated at St. John's College, Cambridge, where in 1529 he became a fellow. On account of his great abilities, he gained an exhibition from the king and in 1540 he was made prof. of Gk. at the univ. He numbered amongst his pupils at St. John's Roger Ascham, who always spoke of him in high terms of praise, both for his learning and character. He introduced a new pronunciation of Gk., which at first raised much opposition at the univ., but C. finally prevailed, and the system was used in England until quite recent years. He was apostrophised by Milton in his 'Tetrachordon' sonnet. In 1554 he was made tutor to young Prince Edward. In later years he was banished from England on account of his zealous religious opinions. He remained abroad from 1554 to 1556, then whilst travelling one day from Brussels to Antwerp, he was treacherously arrested by order of Philip of Spain and sent to the Tower of London. Terrified by the threat of death, he publicly renounced his religion, and was received into the Church of Rome.

Chekhov, Anton Pavlovitch, see TCHERKHOV.

Chekiang, or **Chehkiang**, coastal prov. of China. The Hanshan range runs through the centre of the prov. from S.W. to N.E., and divides it into a N. portion, the greater part of which is drained by the Chientang R., and a S. portion, which is chiefly occupied by the Tachi basin. The hilly portion of the prov. provides large supplies of tea, and in the plains a great quantity of silk is produced. Minerals are poor—a little coal and iron and occasionally some copper are found—but other products such as cotton, rice, ground-nuts, wheat, indigo, and beans may be had in abundance. The prin. cities are Hangchow and Wenchow. Area 39,500 sq. m. Pop. over 21,000,000.

Chelan, Lake, in Okanogan co., Washington. It is 55 m. long, and from 1 to nearly 2 m. wide. All round are rock walls 4000 to 5000 ft. high, and the greatest depth is about 14,000 ft. It discharges by a short outlet into Columbia R.

Chelate Compounds, compounds in which a ring occurs, some part of the ring being formed by a co-ordinate linkage, thereby differing from the ordinary type of ring, in which all the valencies in the ring are co-valencies.

Chelický, Petr (c. 1390-1460), Bohemian writer. He has been called the Tolstoy of the fifteenth century, for his horror of bloodshed and determination to accept unresistingly even the tyrannical rule of worldly authorities. Born at Chelčic, near Vodnan, the son of a small landowner, he studied for some years at Prague. During the Hussite wars he took no part, although opposed to the Church of Rome. His prin. work is *Sil viny* (The Net of Faith).

Chelidonium majus, see CELANDINE.

Chelifer, genus of arachnid in the order Chernetidea, and is typical of family Cheliferidae, the only one of the order. *Ch. cancrídes*, the book-scorpion, is sometimes found in houses among old papers and furniture; it occurs in Britain with four other species.

Chelm, see Kholm.

Chelmo, see KULM.

Chelmsford: 1. Co. and mkt. tn. in Essex, England, 29½ m. N.E. of London; situated between London and Colchester. The prin. industries are the manuf. of agric. implements, electric light, and engineering works, iron foundries, malt works, and corn mills. The corn and cattle markets are among some of the most important in the co. The tn. possesses a grammar school founded by Edward VI. and works of Marconi's Wireless Telegraph Company Ltd. Pop. 27,000. 2. City of Middlesex co., Massachusetts, U.S.A. Pop. 8000.

Chelmsford, Frederic Augustus Thesiger, second Baron (1827-1905), eldest son of the first Baron C. He was educated at Eton, and in 1844 entered the Rifle Brigade. From an ensign in 1854 C. became a general in 1888. After serving in the Indian Mutiny, and taking part in the capture of Magdala, C. was made Companion of the Bath and aide-de-camp to Queen Victoria. He routed the Zulus in the war of 1879 under Cellinga at Ulundi, and in 1881 was appointed Lieutenant of the Tower of London, which post he held until 1889.

Chelmsford, Frederic, John Napier Thesiger, first Viscount and third Baron (1868-1933), eldest son of Frederic Augustus, second Baron. He was educated at Winchester and at Magdalen College, Oxford; and was fellow of All Souls, 1892-99, and fellow of Magdalen, 1917. He was a member of the London School Board, 1900-4, and of the London Co. Council 1904-5—alderman 1913. He succeeded to the barony in 1905, and was governor of Queensland 1905-9. In 1908 there was a constitutional crisis in that state—the Prime Minister demanding appointments to the legislative council for a purpose similar to that of the threatened creation of peers in England in 1910. Lord C. refused and dissolved the Assembly, an act that aroused much indignation in Australia and some demand for a system of Australian-bred governors. In Aug. 1909 he was transferred to New S. Wales, where he governed till 1913. He was a captain in the Dorset Regiment, and served with it in India early in the First World War. In 1916 he was appointed viceroy of India, and in the following year he produced jointly with E. S. Montagu, the secretary of state, a report on constitutional progress, recommending a limited application of representative gov., which, introduced in 1919, created what was called dyarchy. On April 13, 1919, occurred the famous Amritsar riot (q.v.). In April 1921 Lord C. gave place to Lord Reading. In 1924 he was First Lord of the Admiralty in the Labour Gov.

Chelmsford, Frederic Theaiger, first Baron (1794-1878), lord chancellor of England. He entered Gray's Inn in 1812, and became a member of Parliament for Woodstock in 1840. In 1844 he became solicitor-general, and in 1845 attorney-general. On Lord Derby coming again into office in 1858 Sir Frederic was raised straight from the Bar to the lord chancellorship.

Chelonia, genus of lepidopterous insects of the family Arctiidae, the species of which are known as tiger-moths.

Chelonia (Gk. *χελώνη*, tortoise), name of a sub-class of reptiles which comprises such well-known animals as the tortoises, turtles, terrapins, and loggerheads, and of which many fossil species have been found. There are about 300 living species, dwelling chiefly in warmer climates, some as terrestrial animals, while others are aquatic, and may inhabit either fresh or salt water.

Chelsea, parl. and metropolitan S.W. bor. of London, of much historical interest. Here is situated the Royal Hospital for Invalid Soldiers, which was opened in 1694, and accommodates 500 inmates. Chelsea Bridge, leading from Chelsea Hospital to Battersea Park, was reconstructed and widened in 1937. The Chelsea Physic Garden (Royal Hospital Road), a garden of general botanical research, was estab. in the latter part of the seventeenth century by the Society of Apothecaries. The duke of York's School, for the education of boys for the army, founded 1801, was removed from here to Dover in 1909. In 785 the name was *Cealchythe* and a similar name is to be found both in a Saxon charter of the eleventh century and in Domesday Book; in the sixteenth century it was called *Chelith*. The later ending *ea* or *ey* was associated with the insular nature of the land and the prefix with *shingle* (*Chesil* *ea*, shingle island or bank; but the older suffix, *hythe*, means a haven). In the picturesque church of St. Luke, or Old Church, as it is generally called, there are many memorials to past notabilities which to a great extent establish the hist. of C. Amongst others are those of Sir Thomas More, Lady Jane Guydeford, Sir Hans Sloane, Thomas Shadwell (poet laureate), Woodfall (printer of *Junius*), and Sir John Lawrence. In modern days C. has been the home of many noted men, Turner, Rossetti, Leigh Hunt, Whistler, Carlyle, and others. Carlyle's house, 24 Cheyne Road, is now maintained by the National Trust as a museum. The bor. was formerly famous for its buns and porcelain. C. returns one member to Parliament. Pop. 64,000. See R. Blunt, *The Lure of old Chelsea*, 1922.

Chelsea, city in the co. of Suffolk, Massachusetts, U.S.A., situated on a peninsula between the Mystic and Chelsea Rs. Flexible tubing for electric wires was first made here in 1889. Pop. 48,000.

Cheltenham, municipal and parl. bor. of Gloucester, England. The tn. lies in the valley of the Chelt, under the Cotswold Hills. In 1718 mineral springs were discovered, and after a pump-room had

been built in 1738, it soon became an important as well as a fashionable health resort. The visit of George III. in 1788 still further ensured the success of the tn. The chief spas are the Old Wells, Montpellier, Pittville, and Cambray. It is quite modern in appearance, and has a new tn. hall, with a spa and assembly rooms, opened 1903. There is also a very fine museum and art gallery. The oldest church is St. Mary's, dating from the fourteenth century, but since that time it has been entirely restored. Not only is C. famed for its mineral waters, it is also a great educational centre, the Ladies' College being one of the most celebrated in England (see CHELTENHAM LADIES' COLLEGE). Cheltenham College (1840) is one of the great public schools of England. There are a school of arts and crafts and also a college for the training of male and female teachers in the national schools. Pop. 51,500.

Cheltenham College, public school, founded in 1841, and incorporated in 1894 by Act of Parliament. The buildings are extensive and handsome, and include sev. boarding-houses for the students. The military side of education is made a strong point. Recognised as a medical school for the teaching of chem. and physics, by the College of Physicians and Surgeons. The average number of students amounts to about 600, who may gain numerous scholarships to the univs. Among former pupils may be mentioned Lord James of Hereford, W. E. H. Lecky, John Morley, and Briton Rivière.

Cheltenham Ladies' College. The opening of Queen's College (*q.v.*) in 1848 having already begun a movement for the better education of women, the C. L. C., in a humble way, came into being in 1851. The founding of the college was chiefly due to the Rev. W. Dobson, principal of Cheltenham College, and the Rev. H. Walford Bellairs, then inspector of schools for Gloucestershire, and, later, hon. canon for Worcester. Incorporated 1880 it is now one of the most important colleges for girls in England. It is notable as being the first school to provide a sound education on the public school boarding system like that for boys. It comprises three divs. for girls under various age groups and prepares its pupils for London Univ. degrees, the Higher Certificate, the London General Certificate, and the School Certificate examinations, and also for music, science, and art. Besides possessing 120 rooms, it has a museum, a library, art studios, observatory, and laboratories.

Chelyabinsk, or **Tochelyabinsk**, tn. and region of the R.S.F.S.R., on the E. side of the Urals. The dist. is a grain-producing centre but is liable to periodic droughts. The tn. is 347 m. E.N.E. of Chkalov (Orenburg). It has some of the largest tractor works in Russia. Brown coal is mined at C. for use locally as a fuel. Other industries are the distilleries and tanneries, and there is an active trade in corn. The railway station lies about 3 m. from the tn., and is the junction of

the lines from Moscow, Kuiblishev, and Ufa on one side, and from Sverdlovsk on another. Pop. 274,000.

Chelyuskin, or **Cape Severo**, Taimyr National Region, Siberia, is the most N. part of the Taimyr peninsula; it is 50 m. wide, and stretches for a length of 100 m. into the Arctic Ocean.

Chemical Action, see **CHEMISTRY**.

Chemical Affinity, see **AFFINITY** and **CHEMISTRY**.

Chemical Analysis, see **ANALYSIS**, **CHEMICAL**.

Chemical Energy. Since molecules and atoms are conceived of as being in a state of motion, it is evident that by virtue of this motion they must contain *energy* (*q.v.*). In most chemical reactions heat is evolved, and they are said to be exothermic. On the other hand, heat may be absorbed, in which case the reaction is endothermic. This contained energy cannot be measured directly, but the energy set free during chemical reaction can, and this is termed chemical energy. It can even then only be measured by converting it into heat or electric energy. It might here be noted, perhaps, that the amount of energy measured only represents the difference between the contained energy in the resultant compound and that contained in the substances which took part in the reaction. See **THERMO-CHEMISTRY**.

Chemical Engineering. This subject is defined broadly by the Institute of Chemical Engineers as 'the branch of engineering which relates to the design, construction, erection and operation of plant and works in which matter undergoes a change of state or composition.' The work of the chemical engineer is therefore very varied, and as stated by Prof. Hinchley, one-time honorary secretary of the Institution of Chemical Engineers, 'he must be able to devise simple and effective methods of recording operations and determining actual costs; prepare designs, specifications, and estimates free from error; report efficiently on any problem investigated; obtain technical information readily and compile and index it for future use.' A chemical engineer should possess a good knowledge of chem. and physics, particularly physical chem. and thermodynamics; and should be well grounded in the theory of design of structures as well as the strength of materials. In addition, the commercial or economic aspect must be studied, including business management and factory organisation, together with the Factory Acts, Trade Union Law, and the various other points with which works managers have to deal. The Institute of Chemical Engineers was incorporated in 1923, and by various means, including holding of examinations and granting certificates of competency, has done much to clarify the position of C. E. The processes of C. E. fall into three classes: (1) transport and storage of materials; (2) treatment of materials; (3) production, transfer, and conservation of heat energy. These may be further subdivided, but in each case exact knowledge is necessary if

efficiency is to be secured. The difficulty of translating a laboratory idea to the works scale is often very great, and failure to appreciate the differences between familiar laboratory apparatus, such as beakers, crucibles, retorts, mortars, etc., and their works equivalents, may easily lead to failure. Methods of weighing and measuring are very important, because the cost of transport may be the most expensive item in the production, and the cost of carrying material to a machine or an apparatus may be as great as the cost of the operation carried out. In the layout of a works or factory, after arranging for satisfactory facilities for carriage by road, rail, or water, many civil engineering problems may be encountered in the erection of heavy plant, furnaces, and chimneys in various subsoils. Provision of power, light, and heat, and the nature or source of the motive power to be used, together with the provision of suitable water-supply, often in large volume, and the satisfactory disposal of effluents, all call for knowledge and judgment of a high order.

The materials of plant construction for chemical processes are very numerous, and include timber, metals, alloys, bricks, cements, and compositions. Continuous search for new materials to meet more stringent conditions of service has resulted in great advances during recent years, and special alloys and alloy steels, silica ware, glass, and stoneware have all resulted in modified design. In chemical reactions, the processes contemplated must be first studied on the small scale by the chemist and then dealt with, if satisfactory, by the chemical engineer on the large scale. In the latter case additional factors, apart from reaction time, effect of impurities, and strength of materials, arise, such as cost of plant and materials, continuous or discontinuous operation, etc. Very often efficiency is much increased by changing from batch to continuous operation.

The flow of fluids, processes of extraction, evaporation, crystallisation, distillation, condensation, and the drying of gases, liquids, and solids are all processes the study of which may convert failure into success, while the transfer of heat involves some of the most exacting problems known to the chemical engineer.

Chemical Industry, Society of, was estab. in 1881 to forward the extension of industrial and scientific chem. The society was incorporated by royal charter in 1907. There are eleven local sections of the society in Great Britain, five in Canada, and one each in Australia and America. In addition there is a special chemical engineering group. The society publishes its jour. weekly, over 5000 copies being distributed. It contains a review section, 'Chemistry and Industry,' the Transactions, and Section B of 'British Chemical Abstracts.' The yearly subscription includes the jour. and membership of a local section. The presidential chair has been occupied by many eminent chemists. The headquarters of the society are at 56 Victoria St., London, S.W.1.

Chemical Society, formerly the Chemi

Society of London, estab. in 1841, and incorporated by Royal Charter, 1848, for the advancement of chemical science. Its centenary celebrations were postponed owing to the war, from 1941 to 1947. The society consists of fellows, associates, and members, both honorary and foreign, and is governed by a council chosen by the fellows. Those wishing to be elected as fellows must possess a certificate which has been signed by five fellows of the society, and they must be known personally to at least three of them. The headquarters are at Burlington House, Piccadilly, London, W.1.

Chemical Warfare, although now regarded as a barbarous practice, is by no means new. The ancients in Greece, centuries before the Christian era, poisoned or choked each other with sulphur fumes. It was also a practice to place dead animals in such a position that the gases emitted from the carcass during decay would drift towards the enemy and cause disease. The use of poisonous gases in the Middle Ages is also on record. With the 'humanising' of war and the recognition of laws of war, drawn up and agreed to by most civilised nations, C. W. was prohibited by a declaration of The Hague Conference in 1899. Great Britain at first withheld assent to the rule, because the conference was not unanimous, but agreed in 1907. The U.S.A. never agreed to the rule, on the ground that sufficient information on the subject was not available on which to base a decision. During the wars of the latter half of the nineteenth century—the Crimean, Amer. Civil war, and Franco-Ger. war—suggestions for the employment of poisonous gases were not wanting, but in no case were they adopted. Poisonous gases are not mentioned specifically in the Convention of 1907, but Article 23 prohibits the signatories from employing poison or poisoned weapons. Although Germany was one of the signatories to this convention, she was the first to use poisonous gas during the First World War. On April 22, 1915, in the Ypres salient, Germany launched a gas attack from cylinders charged with a mixture of phosgene and chlorine, causing its victims either intense pain or death. It appears to have been a foregone conclusion in military circles that Germany would break the convention on this point, the belief being based on the fact that an official publication of the Ger. Army dated 1910 advocated the fullest use of modern inventions, however dangerous. The effect of this attack was terrible, because the forces of the Entente were not prepared for the violation. As the greenish-grey cloud spread over the unprotected troops it blasted everything it touched and shrivelled up the vegetation. A cry went up at once for protective methods against gas, and a simple respirator was immediately devised and issued to the troops in the trenches. The Entente had no alternative but to retaliate in kind, and throughout the war new methods of attack with, and defence against, gas were devised. In attack the gases were either released from cylinders

and carried to the enemy lines by a favourable light wind (and usually in damp weather) or were enclosed in shells fired from artillery or dropped in bombs from aircraft. The defensive measures usually consisted of some form of respirator containing a chemical which neutralised the harmful gas. The most dangerous gas was mustard gas, which burned the body, piercing clothing and equipment with ease. Gas drill became essential, and sentries were regularly posted to watch and give warning of its approach. Dug-outs were partially protected by hanging damp curtains before the doors. At the Washington Conference in 1922 the great powers agreed to prohibit the use of every kind of asphyxiating and poisonous gas in war. Chemical warfare was not practised in the Second World War, unless the use of the atomic bomb may be so described; this was, however, rather physical than chemical. See also **CHLORINE IN WARFARE**. See J. B. S. Haldane, *Callincus: a defence of chemical warfare*, 1925.

Chemin de Fer, Baccarat. One of the two forms of the anc. card game of baccarat, the other being *baccarat banque*. The element of chance is all-preponderating. The object of the game of baccarat, whether C. de F. or *baccarat banque*, is to hold such cards as shall together amount to the point of 9. Every card of the value of 10, and every 10 occurring as part of a total, are disregarded, or, as it is called, is *baccarat*, i.e. zero. For C. de F. six packs of cards are required. The croupier then hands an arbitrary quantity from the top of the pack to the player on his right, who for the time being is dealer or banker. The latter then places in front of him the amount he wishes to stake, and the rest, or punters, make their stakes. Any punter may, if so disposed, 'go bank,' i.e. play against the whole of the banker's stake. If the total staked does not equal the amount in the bank, other players standing round may add stakes. The banker then deals four cards, face downwards, the first for the players on his right, the third for the player to his left, the second and fourth to himself. The player who has the highest stake represents the other punters, but if two have staked equal amounts, the first in rotation has the preference. If the banker wins he takes the stakes, but if the punters win the amount of his stake is paid to each punter in rotation out of, but only to the extent of, the amount in the bank, the banker not being liable for more than his stake. If the banker wins he deals again; if not, the player next in rotation becomes banker. The game may not end, however, in the way above described. If either the banker or representative punter finds that he can score neither 9 nor 8 (the next best point) with his two cards, he need not turn up his cards. The punter may then draw another card on the offer of the banker. Apparently by the etiquette of the game, the punter, if his point is 0, 1, 2, 3, or 4, must accept this third card; if his point

is 6 or 7 he must refuse; if 5 he has a real option. It is then the banker's turn to decide whether he himself will draw a card, and having drawn or not drawn, as he elects, to expose his cards. A tie neither wins nor loses, the stakes abiding the result of the next hand. In the variation, *baccarat banque*, the bank is put up to auction. The same rules as to offering and accepting and turning the cards up apply as in C. de F. If the stakes of the punters exceed the amount in the bank, the banker on losing does not have to pay out beyond the amount of his own stake. The punters are paid in rotation so far as this stake extends, and those who have got nothing must wait for another successful coup. Both forms of *baccarat* are included in the games made illegal by the Eng. criminal laws against keeping common gaming-houses.

Chemin des Dames, area in France situated just N. of the R. Aisne, between Rheims and Laon, and the scene of much fighting during the First World War, in the Champagne prov. (*q.v.*). In their initial offensive in the autumn of 1914, the Gers. swept over this area, and in the counter-attack the Entente pushed them back as far as this point, on which they rested for many months. A Fr. offensive on a large scale in the Champagne area was planned for the spring of 1917, but sev. highly placed ponticians who disliked Nivelle, the new commander-in-chief, caused it to be postponed. Eventually an advance was commenced in the middle of April, and after much fighting at great sacrifice the Fr. gained a little ground in the C. des D. sector. The importance of this sector was appreciated by both sides, and during the autumn of 1917 the possibility of capturing it again exercised the minds of the Fr. higher command, and it was decided that another attempt to seize it should be made before the end of the year. An offensive was commenced in the middle of Oct., and by the 26th so much progress had been made on the flanks of the position that the Gers. considered it wise to evacuate it. Being in the direct road to Paris from Belgium and N.E. France, C. des D. became the scene of much fighting when the Gers. made their offensive during the spring of 1918. Here their overwhelming numbers, aided by secrecy of their intentions, easily overran the surprised Fr. garrisons and drove them across the R. Aisne. In the following July the Entente delivered its counter-offensive and drove back the Gers. the way they came. This necessarily brought C. des D. once more to the fore as a scene of action, and much fierce fighting took place in this region. In this sector the Fr. troops were under the command of Gen. Mangin, a vigorous and able man who knew every detail of the ground over which the fighting was taking place. The Gers. held this stepping-stone to Paris as long as possible, and it was not until the end of Sept. 1918 that they were eventually driven beyond this area. Once Mangin's army had forced the Gers. into retreat they were given no respite until the armistice brought operations to a close.

See also FRANCE AND FLANDERS, FIRST WORLD WAR CAMPAIGNS IN.

Chemin des Rondes, level space, about 12 ft. broad, which is formed outside the rampart of a fortress or of an outwork, and raised a few feet above the ground. It is protected on the exterior by a low wall. It is useful as a path for superintending officers, and is a station for defenders who are preventing scaling-ladders from being placed against the escarp-revetment.

Chemiotaxis, see under FERTILISATION.

Chemist and Druggist. Since the Pharmacy Act of 1868 this title is especially reserved for those who have passed the 'minor' examination of the Pharmaceutical Society of Great Britain (founded 1841). In U.S.A. the terms apothecary, druggist, pharmacist, and chemist are used practically as equivalent names for those licensed to compound and sell medicinal drugs and poisons, but the three classes are quite distinct in the United Kingdom, apothecaries forming the lowest rank of the profession, and pharmaceutical chemists the highest (having passed a 'major' examination). Chemists and druggists have a licence to compound and sell medicinal drugs and poisons under the Acts of 1852 and 1868. To gain the title an apprenticeship of three years must be served under someone already qualified, and a general knowledge examination equal to the Medical Preliminary of the General Medical Council must be passed. For a long time in England the policy of Cs. and Ds. was defensive, and by 1802 a defensive association was formed, which, later, strongly opposed the Bill of the Associated Apothecaries, 1812-15. Laws have been passed to define the liability for injuries caused by carelessness or ignorance. The Hist. of Scottish druggists has practically coincided with that of Eng. since the Pharmacy Act of 1868.

Chemistry, branch of that science which consists in the study of the changes which matter is capable of undergoing. These changes may be divided into physical and chemical, and although in the higher stages it is impossible to draw a definite distinction between them, C. and physics being converging sciences, examples can be given of both varieties of changes. For example, a steel needle rubbed on a magnet in a definite way undergoes *physical* change by means of which it acquires the power of the magnet. On the other hand, a match rubbed on a match-box undergoes a *chemical* change by means of which flame is produced. Thus it is possible to make a distinction between the sciences of C. and physics. A chemical change involves some alteration in the composition of the substance. The match having been ignited has undergone a permanent change, whereby it is no longer combustible. The physical change quoted above involves no alteration in the substance itself, and the acquired property is further only temporary and can be continually lost and reacquired. The difficulty occurs in this fact, however, that every chemical change is accompanied by physical change, and the

physical change may often be the only sign that chemical change has taken place. But it might be said that C. is concerned with the investigations of the changes that occur when the molecular structure of any substance is altered.

History.—The anct. civilisations, Egyptians, Phœnicians, Gks., and Roms., were familiar with sev. of the metals and the processes of extracting them from their ores, while they also knew how to make alloys usually copper, lead, and tin. In addition to this the anct. were

although it might possibly have been better directed—the discovery of radium and its congeners having proved the theory that the transmutation of elements is possible. Modern C. may be said to commence with Robert Boyle (1627–91), for he was the first to endeavour to rid C. of its alchemic tendencies. In his book the *Sceptical Chymist* (1661, 1680) he discredited the alchemic theory regarding salt, sulphur, and mercury as the elements of substances, and at the same time gave a scientific definition of an element. He



AN OLD CHEMICAL LABORATORY

familiar with the manufacturing processes concerned in the making of soap, starch, glass, leather, stoneware, wine, and beer, before they were familiar with the process of distillation. Geber (Jabir Ibn Hayan) an Arabian chemist of the eighth or ninth century A.D. knew white arsenic, borax, common salt, alum, copperas (ferrous sulphate), and possibly sulphuric, nitric, and acetic acids. The apparatus used by him was similar to that used until the eighteenth century. From the eighth to the seventeenth century the science of C. drifted into the hands of the alchemists. They were concerned with the production of gold from baser metals, and in their search for the philosophers' stone; and in the course of their studies they discovered many potent medicines. Their writings are preserved, but the majority of them are of doubtful value from a scientific standpoint, for they are so mixed with philosophical extravagance that they are unintelligible. At the same time it must be remembered that their work was not entirely valueless,

it was who introduced the air-pump and the thermometer to this country, and his experiments on the physical properties of gases gave us Boyle's law concerning the relation of the volume of a gas to the pressure exerted on it. Following him we have Becher (1635–82), and Stahl (1660–1734), who formulated the phlogiston theory of combustion. This theory stated that phlogiston was contained in all combustible substances. The act of combustion was regarded as the escape of phlogiston from the burning substance. Thus, when lead was burnt the material left, lead oxide, was regarded as the other constituent of the metal and was the calx. By heating a calx with some other substance rich in phlogiston, the metal was again produced, as when lead oxide is reduced on charcoal. This theory received a fatal blow when Boyle showed that the calx was heavier than the metal, and that consequently the addition of the phlogiston to the calx results in a loss of weight. This was explained away, however, by supposing that phlogiston had

negative weight! But it was thoroughly disproved after the discovery of oxygen by Priestley, Scheele (independently), and Lavoisier who finally destroyed it. In the meanwhile Boerhaave (1668-1738) pub. a system of C., and Marzgraf (1709-1782) studied alumina and magnesia and worked on the quantitative analysis of substances in solution. Among famous Eng. chemists of this time may be named Cavendish (1731-1810), who studied hydrogen and atmospheric air, and made the important discovery of the compound nature of water and nitric acid, and Priestley (1733-1804), who discovered oxygen and studied nitric oxide, nitrous oxide, hydrochloric acid, and ammonia gases, etc. Lavoisier (1743-94) was the first to lay down a real system of chemical nomenclature. Scheele (1742-86), who lived in Sweden, discovered a large number of acids, chlorine, and oxygen. Richter (1762-1807) discovered the law of reciprocal proportions, *i.e.* that if the weights of various elements, which combine with a given weight of another element, be compared, then they bear a simple relation to the proportions in which those elements will combine amongst themselves, *e.g.* chlorine and hydrogen combine with phosphorus in the proportions of weight—phosphorus: chlorine = 1 : 3.3; phosphorus : hydrogen = 1 : 0.097. Chlorine and hydrogen also combine to make hydrochloric acid, and they do so in the proportion—chlorine : hydrogen = 35.5 : 1; and 35.5 : 1 = 3.43 : 0.097. Berthollet (1748-1822) studied chemical affinity and applied chlorine to bleaching, and Dalton (1766-1844) stated the atomic theory which placed C. on the basis of an exact science. Among the great chemists since may be mentioned Gay-Lussac (1778-1850), Dulong (1785-1838), Wollaston (1766-1828), and Davy (1778-1829), who discovered the use of electricity for decomposing soda and potash with the consequent separation of the metals sodium and potassium. Berzelius (1779-1848) confirmed the law of constant proportions, fixed many atomic weights, and formulated the electro-chemical theory of the constitution of salts. Those chemists mentioned above, while not regardless of organic C., devoted their attention to the study of inorganic C. In 1828 Wohler (1800-1882) discovered that urea could be made in the laboratory, and this has led to a great research into organic C., so making it a distinct and important subsistence. This work has been led by Dumas (1800-84), Liebig (1803-73), Laurent (1807-53), Gerhardt (1816-56), Wurtz (1817-84), Kolbe (1818-84), Frankland (1825-99), Williamson (1816-95), and others. Among general chemists of more recent times may be mentioned Faraday (1791-1867), Rose (1795-1864), Bunsen (1811-99), Regnault (1810-78), Mendeleev (1834-1907), Ostwald (1853-1922), Van't Hoff (1852-1911), Sir Wm. Ramsay (1852-1916), Sir Wm. Crookes (1832-1919), Sir James Dewar (1842-1923), Mme Curie (1867-1934), and Irving Langmuir (b. 1881).

Elementary Principles of Chemistry.—

Now to proceed from the general consideration of the science, in the first place we must recognise that to the chemist all matter, solid, liquid, or gaseous, is composed of minute particles called *molecules*. The molecules of any substance are all similar. In each of the three states, solid, liquid, and gaseous, the molecules are always supposed as moving. The movement will be greatest in the gaseous state, where the spaces between the molecules are greatest, and smallest in the solid state, where the inter-molecular spaces are smallest. Then, further, molecules themselves are in most cases possessed of a structure. These particles of which molecules are formed are called *atoms*, and the force that holds these together is called chemical affinity (that holding molecules together being physical, and known as cohesion), and, again, these atoms are conceived as being in a state of motion. With this in mind it is now possible to say that any change which leaves the molecules intact is a physical change, while any change in the structure of the molecule itself may be said to be chemical. It is now known that the atom is not the simple, ultimate particle of matter once supposed, but that atoms consist of an electrically positive nucleus, where resides most of the mass, surrounded by electrons, or units of negative electricity, which rotate in different orbits, variously inclined to each other, and at different distances from the nucleus. The atom may be roughly compared to a miniature solar system with the nucleus representing the sun. In the case of the lightest element, hydrogen, the atom has the simplest structure, and consists of one electron rotating about the nucleus, while the most complicated structure is presented by the heaviest known element, uranium, the atom of which has ninety-two electrons. Many names, such as those of Rutherford, Thomson, Lewis, Langmuir, and Bohr, are associated with theories of the structure of the atom, but undoubtedly much work remains to be done. The latest theories are due to Schrödinger, Dirac, de Broglie, Chadwick, and others.

Elements and Compounds.—Some molecules contain atoms of the same kind, while others contain atoms of different kinds. Thus, in a molecule of water there are atoms of hydrogen and oxygen, while in that of sulphur all the atoms are alike. When all the atoms are similar, we call the molecule an *elementary* one and speak of the substance as an *element*. On the other hand, we speak of the molecule with different atoms as a *compound* molecule, and the substance as a *compound*. Now it is evident that if a substance is composed of more than one kind of matter, *i.e.* is a compound, it can be built up from the component substances (*synthesis*), or separated into these simpler substances (*analysis* or *decomposition*). If any substance can neither be split up into simpler substances nor built up from them it is said to be an *element*, and we assume that it consists only of similar

atoms. At the present time there are about ninety elements. It is possible that some of these may, in time, be proved not to be elements, but at present it has not been possible to decompose further any of them, except into electrical particles. The number of compounds is practically infinite, since they consist of combinations of these elements. All substances which are not elements are not necessarily compounds. They may be *mechanical mixtures*. When elements are brought together, they may just mix without losing their identity or separate properties, or the atoms in molecules of the various sorts may separate out and re-mingle to form other and different molecules with perhaps quite distinctive properties. The former would be said to be a mechanical mixture and the latter a chemical compound. For example, carbon, sulphur, and nitre mix to form a dark grey mechanical mixture, which can be separated out again into its three constituents by quite mechanical methods. This mixture is called gunpowder, but if by any means this mixture be exploded the result is a rearrangement of the atoms into different molecules with the consequent formation of chemical compounds. Chemical compounds are only produced by *chemical action*, which really consists in the rearrangement of various atoms into new molecules. This may result by: (1) the direct union of two molecules to form a more complex molecule; (2) an exchange of atoms between molecules; (3) the rearrangement of atoms within a molecule. As an example of (1) we may take the union of a molecule of carbon with one of oxygen to form carbon dioxide; of (2) the union of a molecule of hydrogen with one of chlorine, each containing two atoms, to form two molecules of hydrochloric acid each containing one atom of hydrogen and one of chlorine; of (3) ammonium cyanate warmed gives urea. Both contain the same atoms, only in different arrangements, yet their properties are entirely different. Chemical action may result from a variety of causes. In some cases it is sufficient just to bring two substances together. In others heat is required to cause it. Chemical action is always accompanied by the evolution or the absorption of heat. In the latter case, heat must be supplied to the substances to cause the action, *e.g.* if iron be brought to a dull red heat and it be placed in oxygen, it burns fiercely with the formation of oxides of iron. Phosphorus, on the other hand, combines with the oxygen in the air at the ordinary temp. with the evolution of heat and light. In some cases light is essential to chemical action, as, for example, when chlorine and hydrogen gases are mixed, unless light be given them they will not combine. Photography depends entirely upon the fact of light causing chemical action. Again, in some cases while heat is required to start chemical action, the great evolution of heat in the process is afterwards sufficient to keep the action proceeding, *e.g.* it is necessary to heat a

strip of magnesium in order that it may take fire. Then, however, no further heat is required, the great heat evolved being sufficient to set the strip burning furiously until the end is reached. Pressure also may cause chemical action, *e.g.* the two gases hydrogen chloride (HCl) and hydrogen phosphide (PH₃), will combine to form the solid phosphonium chloride under pressure. Sound also may cause chemical action. An explosion of mercury fulminate causes acetylene gas to break up the solid carbon and hydrogen gas. A peculiar process of chemical action can only be brought about in the presence of a third substance. In some cases this third substance is known to take a part in the action, while in others its action cannot be traced. In any case, however, that third substance is, at the end, unchanged. This type of action is known as *catalytic*. Further, some forms of chemical action require moisture. The rusting of iron, or the combination of sodium and chlorine to form common salt, cannot take place in an absolutely dry atmosphere if the substances have also been thoroughly dried.

Chemical Symbols.—In order that we may shortly express chemical compositions, certain symbols are used to denote the various elements. Under ELEMENT (*q.v.*) these symbols will be seen following the name of the element. As will be seen, in some cases the symbol is the first letter in the name of the element, *e.g.* the symbol for Sulphur is S. In other cases where sev. elements start with the same letter, the first and some prominent letter in its pronunciation is used, *e.g.* the symbols for Carbon, Cobalt, and Chlorine are C, Co, and Cl respectively. In other cases the symbol is taken from the first and some other letter in the Lat. name for the element, *e.g.* Antimony (Stibium), Gold (Aurum), Lead (Plumbum), and Iron (Ferrum) are represented by Sb, Au, Pb, and Fe. These symbols in all cases stand for 1 atom of the element. A molecule is composed of various numbers of atoms, *e.g.* a molecule of hydrogen contains 2 atoms always, while a molecule of phosphorus always contains 4 atoms, while that of oxygen is always composed of 2 atoms. When 3 atoms of oxygen unite to form one molecule we get ozone. So to represent a molecule of an element it is necessary to state how many atoms are in it, and that is done by means of a small numeral placed after the symbol. To express the above facts molecules of hydrogen, phosphorus, oxygen, and ozone would be represented by H₂, P₄, O₂, and O₃. Again, the composition of a compound molecule is denoted in the same way. A molecule of sulphuric acid is composed of 2 atoms of hydrogen, 1 of sulphur, and 4 of oxygen, and would be represented symbolically by H₂SO₄. In some substances groups of atoms are combined to act as a single atom within a molecule, and to express this fact brackets are necessary, *e.g.* (NH₄)₂SO₄ represents a molecule of ammonium sulphate, which contains 2 atoms of nitrogen, and 8 of hydrogen combined into two groups.

each consisting of 1 atom of nitrogen and 4 of hydrogen, together with 1 atom of sulphur and 4 of oxygen. These groups within brackets are known as *compound radicals*, and any representation of chemical formation of molecules is termed a *formula*. Whenever it is necessary to represent more than 1 molecule, a numeral is placed before the formula, e.g. $2\text{H}_2\text{O}$ represents 2 molecules of water. By means of these formulæ chemical reactions can be shortly expressed in the form of an equation. The substances used are placed on the left and the resulting substances on the right. Thus $\text{MnO}_2 + 4\text{HCl} = 2\text{H}_2\text{O} + \text{MnCl}_2 + \text{Cl}_2$ means that 1 molecule of manganese dioxide unites with 4 of hydrochloric acid, forming 2 molecules of water, 1 of manganese chloride, and 1 of chlorine gas. Whenever chemical changes occur that are understood, they can be expressed in this form, and as matter is indestructible, all the atoms that appear on the left must have a place on the right of the equation. This explains the qualitative use of symbols. They have a further quantitative use which will be better understood after a brief consideration of the 4 laws of chemical combination.

1. *The law of constant proportions.*—'The same compound always contains the same elements combined together in the same proportion by weight.' However a chemical compound is obtained, this law holds, and therein lies an essential difference between it and a mechanical mixture which can obviously consist of varied proportions of the mixed substances; for example, common salt, a molecule of which consists of an atom of sodium combined with 1 of chlorine gas, may be obtained from salt mines, by bringing sodium into an atmosphere of chlorine, by adding hydrochloric acid to sodium carbonate, and by a variety of other means. But whenever it is analysed it is always found to consist of 1 part of chlorine to 0.6479 of sodium by weight.

2. *The law of multiple proportions.*—'When the same two elements combine together to form more than one compound, the different weights of one of the elements which unite with a constant weight of the other, bear a simple ratio to one another.' This law was first recognised by Dalton. In some cases the same elements combine together in different proportions, giving rise to two or more compounds. This does not violate the law of constant proportions, for each separate compound always exists with the same proportions by weight of the composing elements. When elements do combine in this way, however, this law holds, and it is best explained by means of examples. The following given by Newth represents the law well. Nitrogen and oxygen unite together to form five different compounds, in which the proportions of nitrogen to oxygen by weight are: Nitrous oxide, 1 : 0.571; nitric oxide, 1 : 1.143; nitrogen trioxide, 1 : 1.714; nitrogen peroxide, 1 : 2.286; nitrogen pentoxide 1 : 2.857. Thus, the relative proportions of oxygen which unite with a constant proportion of

nitrogen are in the proportion 1 : 2 : 3 : 4 : 5 to one another. This holds in all cases, thus verifying the law stated above.

3. *The law of reciprocal or equivalent proportions.*—'The weights of different elements which combine separately with one and the same weight of another element, are either the same as, or are simple multiples of, the weights of these different elements which combine with each other.' In the brief hist. of C. a simple illustration is given of this in the combining proportions of phosphorus with chlorine or hydrogen, and the consequent proportions of combination of hydrogen and chlorine. To show the remarkable application of this law, the following illustrations will serve. Hydrogen, sodium, and potassium will unite with chlorine in the proportions by weight respectively as 1 : 23 : 39 : 35.5. Again, these same elements will unite with bromine in the proportion 1 : 23 : 39 : 80, and with oxygen in the proportion 1 : 23 : 39 : 8. So that taking these separately, we can say that 1, 23, 39, 80, 35.5, and 8 are the *equivalent weights* or *combining proportions* of hydrogen, sodium, potassium, bromine, chlorine, and oxygen respectively. From which we would deduce that were sodium and chlorine (say) capable of chemical combination, they would so combine in the proportions by weight of 23 : 35.5. This is found to be correct.

Atomic theory.—Dalton connected these three laws together and revived the atomic theory. Briefly, it is that matter is made up of minute particles called atoms. Chemical combination takes place between these atoms, i.e. they are drawn and held together by chemical affinity. Should they come into contact with other atoms for which either of the already combined atoms has a much greater affinity, then a process of redistribution of these atoms will take place. The atoms of different elements are supposed as having different relative weights, and these relative weights are supposed as being the same as those numbers which represent their combining proportions. So the equivalent weight of an element is supposed as being its *atomic weight*. Now this theory will satisfactorily account for the three laws mentioned above, and it is a generally accepted fundamental of the science of C. Dalton's theory has to be revised in particular instances. For reasons which need not be given here, the combining proportions of oxygen, carbon, and sulphur, with 1 of hydrogen, are respectively 8, 6, and 16, while in any table of atomic weights the numbers will be 16, 12, and 32.

4. *The law of gaseous volumes or of Gay-Lussac.*—'When chemical action takes place between gases, either elements or compounds, the volume of the gaseous products bears a simple relation to the volumes of the reacting gases.' That is to say, that under similar conditions of temp. and pressure, simple relationship can be estab. between the volumes of gases in any chemical reaction. The important point here can be easily reached

by the following illustration: 2 volumes of nitrous oxide will decompose, producing 2 volumes of nitrogen and 1 of oxygen. Again, 2 volumes of nitric oxide will decompose, giving 1 volume of nitrogen and 1 of oxygen. But a further generalisation can be noted here. Taken by weight, in nitrous and nitric oxides respectively, nitrogen:oxygen :: 28:16 and 32, if we keep the weight of nitrogen constant. By volume in these two gases nitrogen : oxygen :: 2 : 1 and 2 : 2 respectively. So that there is twice as much oxygen by weight and by volume in nitric oxide as there is in nitrous oxide. While if 14 and 16 be the atomic weights of nitrogen and oxygen, then the numbers showing the relative volumes give the number of atoms. This development was brought about by Avogadro, who formulated a hypothesis now known by his name, which stated that '*Equal volumes of all gases or vapour under the same conditions of temperature and pressure contain an equal number of molecules.*' So that weighing equal volumes of gases at the same temp and pressure should give the relative weights of their molecules. Since hydrogen is the standard and the molecule of hydrogen is known to contain 2 atoms, the ratio between the weights of equal volumes of hydrogen and other gases not only gives the densities of the gases, but it helps materially towards determining the number of atoms in a molecule and the consequent discovery of true atomic weights. From this, if we return for a moment to chemical symbols, we shall see that a chemical formula or equation expresses certain quantitative facts. It can easily be seen now, for example, that by the equation $\text{MnO}_2 + 4\text{HCl} = 2\text{H}_2\text{O} + \text{MnCl}_2 + \text{Cl}_2$, we can read that since the atomic weights of manganese, oxygen, hydrogen, and chlorine are respectively 55, 16, 1, and 35.5, 87 parts by weight of manganese dioxide unite with 146 of hydrochloric acid, giving 36 parts of water, 126 of manganous chloride, and 71 of chlorine gas. Since in scientific work the metric system is generally used, the word gramme could be substituted for parts by weight. Not only so, but if the reacting substances are gases we can tell the volumes that react and the resultant volumes, e.g. $2\text{H}_2 + \text{O}_2 = 2\text{H}_2\text{O}$ represents the fact that 2 molecules of hydrogen unite with 1 of oxygen to form 2 of water; it also means that 4 parts by weight of hydrogen unite with 32 of oxygen to form 36 of water, while finally it means that 2 volumes of hydrogen unite with 1 of oxygen to give 2 of steam. These four rules or laws, together with Avogadro's hypothesis, make up the fundamental basis of the science of C., always bearing in mind the fact that underlying all this again is the law of the conservation or indestructibility of matter. Among other principles which underlie the science may be mentioned that of *valency*. In the study of the science it will be noticed that one atom of chlorine and one only will unite with 1 atom of hydrogen. On the other hand, an atom of oxygen

requires 2 atoms of hydrogen to satisfy the conditions of its affinity for hydrogen, while carbon requires 4. All those elements which only require one atom of hydrogen for purposes of combination are said to be *univalent* elements, those that require 2, *bivalent*, and so on through the terms *trivalent*, and *quadrivalent*. Some elements, however, do not combine with hydrogen, in which case they have to be compared with some element with which they do enter into chemical combination, and which is at the same time univalent. One atom of sodium, for example, unites with 1 of chlorine, and may, therefore, be said to be univalent. With elements that combine with hydrogen no higher valency is shown than 4, but with other elements the valency may rise to 6, as is the case with tungsten, which requires 6 atoms of chlorine to unite with 1 atom of itself. As in all the other instances difficulties arise which are beyond the scope of this article, as, for instance, the fact that measured by hydrogen the valency of phosphorus is 3, while measured by chlorine it is 5. As a general rule, however, the highest number of atoms with which 1 atom of an element will combine is taken as representing its valency. The modern electron theory enables us to distinguish (a) positive valency, which represents the number of electrons that an atom—or group of atoms—loses, (b) negative valency, which represents the number of electrons an atom—or group of atoms—gains, and (c) co-valency, which is the sharing of pairs of electrons between atoms. Loss of electrons is characteristic of metallic elements while gain of electrons is characteristic of non-metallic elements.

Metals and non-metals.—Chemists divide the whole range of matter into two great classes: metals and non-metals. The metals generally are opaque, and have surfaces which will reflect light so highly that they are generally spoken of as having a 'metallic lustre.' They conduct heat and electricity well, and are generally malleable and ductile. Non-metals do not possess these properties although they merge into one another, giving transitional elements which may be placed in either group, this depending on whether we consider their physical or chemical properties.

Periodic system.—Thus we could classify elements either as metals and non-metals or according to their valency. But Newlands (1864) developed a system, afterwards improved and estab. by Mendeleev, now known as the Periodic system. It depends upon the atomic weights of the elements. It can be noticed that if a group of elements be taken which closely resemble each other in their general properties; then the atomic weight of one element will be approximately the mean of the atomic weights of the nearest before and after it, ranged in order of atomic weights: e.g. lithium, sodium, and potassium have atomic weights of 7, 23, and 39. Now $(7 + 39) \div 2 = 23$. If the elements in the various families or groups are arranged in the

order of atomic weights, it will be seen that the increase in these weights in each group is practically the same. Thus fluorine, chlorine, and bromine have atomic weights of 19, 35.5, and 80, while nitrogen, phosphorus, and arsenic have atomic weights of 14, 31, and 75, and oxygen, sulphur, and selenium are represented by 16, 32, and 79. Now each three mentioned together here belong to the same family, and the differences between the atomic weights of the first and second in each group are 16.5, 17, and 16, while between the second and third in each they are 47, 45, 47, and these numbers are approximately equal. This cannot be pure chance, and Newlands pointed out that if the elements be arranged in order of increasing atomic weights, the properties of the first seven would reappear in the next seven, so that the first and the eighth, the second and the ninth and so on, would belong to the same group or family. This he called the law of octaves. Mendeleev, as we have before stated, developed this into the periodic law. This, of course, depends upon the hypothesis that the properties of elements are related to their atomic weights. The first seven elements after hydrogen are lithium, beryllium, boron, carbon, nitrogen, oxygen, fluorine, with atomic weights of 7, 9, 11, 12, 14, 16, and 18. The next seven are sodium, magnesium, aluminium, silicon, phosphorus, sulphur, and chlorine with atomic weights of 23, 24, 27, 28, 31, 32, 35.5—the approximate difference of 16 being evident through all—and the element in the second row which corresponds in order with the element in the first row does possess similar properties, and will be found to belong to the same family. As we traverse the rows and pass from lithium and sodium to fluorine and chlorine, we pass from electro-positive soft white metals to electro-negative corrosive gases, while the valency increases as one passes along either row or any succeeding row from one to four and back again to one. After the second row, however, the table gets complex, for the next row consists of seventeen elements: seven take their right places under the other two rows, then come three elements (iron, cobalt, and nickel) which are termed transitional elements, and then seven others which, while they exhibit certain likenesses to the seven preceding, can hardly be placed directly under them. These seventeen elements are known as a *long period* as against the short period of the seven. From here on the periods are all long, and should consist of seventeen elements, but two gaps occur, representing elements of which we yet have no knowledge. The vertical columns in these rows of seven are taken and the alternate elements after the first two rows are placed together and form a family, with similar properties. Thus group one will consist of lithium, sodium, potassium, copper, rubidium, silver, caesium, and gold. Of these, copper, silver, and gold form one family, and the rest fall together. This periodic table is of the utmost value in the study

of inorganic C. It has aided in the true estimation of atomic weights of elements, and has aided in the discovery of new elements; e.g. Mendeleev himself predicted the discovery of an element which he called *eka-aluminium*, and gave its properties by a study of the series and families in his table. Four years later gallium was discovered by means of the spectroscope (as he had predicted) and justified his predictions completely. A study, however, of a periodic system based upon atomic weights brings out several anomalies; for example, argon and potassium, iodine and tellurium, cobalt and nickel would, judging from their properties and behaviour, be placed in wrong positions if arranged according to atomic weights. For long this remained unexplained, but it is now known that the atomic number (see ATOM) of an element is of more fundamental importance than its atomic weight. The above anomalies disappear when the elements are arranged according to their atomic numbers.

Isotopes.—The discovery of radium and the phenomenon of radioactivity, which revealed the startling fact that the atoms of certain heavy elements, such as uranium, thorium, and radium, were undergoing spontaneous disintegration, led Soddy (1910) to suggest that elements might exist which were chemically identical but differed in atomic weights ('isotopes' or 'isotopic elements'). This has since proved to be the case, and although it would appear that chemists about the year 1813 were justified in rejecting the hypothesis of Prout, to the effect that the atoms of all elements were aggregations of hydrogen atoms, yet modern research has shown that when our chemical atomic weights are fractional, it is due to the existence of two or more isotopes of even atomic weight, but present in such proportions that the average weight is a fractional one. Thus, chlorine with atomic weight 35.46 consists of two isotopes of mass 35 and 37. No satisfactory means, chemical or physical, has been found for the complete separation of isotopes so that, in view of the relatively enormous number of atoms taken in all chemical operations the ordinary atomic weights are still used. Much of the work on isotopes has been done by Sir J. J. Thomson, Aston, and Dempster.

Atomic Numbers.—Kaye (1909) found that a solid element, when bombarded by a rapid stream of cathode rays, emits a characteristic X-radiation, which may be resolved into a spectrum by reflection from a crystal, because as shown in the classical researches on crystal structure by the late Sir W. H. Bragg, and his son Sir Laurence Bragg, the internal surfaces of crystals act as diffraction gratings towards X-rays. Moseley (1913-14) used a crystal of potassium ferriocyanide and photographed the spectra of various elements. In this way he obtained what are known as the atomic numbers of the elements. These are whole numbers and when the elements are arranged according to them the periodicity of properties is shown without any anomalies. Briefly

defined, the atomic number of an element is numerically equal to the charge on the nucleus of its atom.

Chemical Nomenclature.—If a substance is a *binary compound*, i.e. is composed of two different elements, then its chemical name is made up from the names of its composing elements, e.g. when hydrogen and sulphur enter into chemical combination the resultant substance is termed hydrogen-sulphide. Sometimes, however, the same two elements will combine together in more than one proportion. Names are then necessary to distinguish one from the other. Prefixes or terminal endings are used for this purpose. Phosphorus unites with either 3 or 5 atoms of chlorine, when it is known as *phosphorous* or *phosphoric chloride* according as there are 3 or 5 atoms of chlorine in the compound. Another and perhaps better method is that by which it is known as *phosphorous trichloride* or *phosphorus pentachloride*. The latter is the more general method. *Sub-* and *proto-* were terms generally in use, but they have fallen into disuse. When oxygen is one of the two elements in the compound, the substance is known as an *oxide*. Some of these oxides, when combined with water, form acids, and are known as *acid-forming oxides* or *anhydride*. All the non-metallic elements except hydrogen form these oxides, and the so-formed acids are called *oxyacids*. Metals give rise to oxides which form *hydroxides* with water, and these oxides are called *basic oxides*. When an acid is brought into contact with a basic oxide a salt is formed. All oxides are named after the substance with which the oxygen is united, and oxyacids are also named after the same substance. Thus carbon dioxide gives rise to *carbonic acid*. When a substance forms two acid-forming oxides the terms *ic* and *ous* are used to denote the one with the greater and the lesser amount of oxygen respectively. Thus sulphur trioxide forms *sulphuric acid*, while sulphur dioxide forms *sulphurous acid*. Acids used to be considered as always containing oxygen, but this view is incorrect, as can easily be seen from the fact that chlorine, fluorine, bromine, and iodine, known in C. as the halogen group, form acids when in combination with hydrogen. When acids are added to bases, salts are formed, and acids which contain more than one atom of hydrogen (all acids have, at least, one atom) can form more than one salt, for a salt is formed by the replacement of the atom or atoms of hydrogen in the acid by the metallic atoms of the base. Thus sulphuric acid (H_2SO_4) contains 2 atoms of hydrogen, and it can give rise to two salts of any metal, e.g., normal potassium sulphate represented by K_2SO_4 and $KHSO_4$. Hydrochloric acid, on the other hand, has only one atom of hydrogen in it, and can only give rise to one salt. Thus according as there are 1, 2, 3, or 4 atoms of hydrogen in an acid, it is known as *mono-*, *di-*, *tri-*, or *tetra-basic*, while a normal salt is one in which all the replaceable hydrogen atoms have been replaced by the base.

Organic and Inorganic Chemistry.—

Organic C. is the C. of the carbon compounds. The element carbon is unique in its remarkable power of forming compounds, principally with hydrogen, or hydrogen and oxygen. The special branch of organic C. is necessary on account of their great and increasing number. The term 'organic' has lost its original significance, that of bodies which could only be produced by the so-called 'vital force' in living matter. That view was practically overthrown in 1828, when Wohler synthesised the organic body urea from the inorganic compound ammonium cyanate. A phenomenon found with extraordinary frequency in the case of carbon compounds is that known as 'isomerism.' Isomers or isomeric compounds are different bodies having the same gross composition but possessing different molecular constitution. For example, one hydrocarbon of the paraffin series has 801 isomers. Many organic bodies are compounds of hydrogen and carbon, and so are called *hydrocarbons*. Petroleum consists of a mixture of hydrocarbons known as the 'paraffins' on account of their comparatively great resistance to chemical attack. The simplest member of the series is methane or marsh gas, the fire-damp of our coal mines. Methane may be looked upon as the type-compound of a div. of organic C. containing many hydrocarbons, animal and vegetable fats and other bodies known as 'aliphatic,' while the hydrocarbon benzene, not to be confounded with benzine (which is a petroleum product), is looked upon as the type hydrocarbon of the aromatic div. of organic C. Many organic bodies have extremely complex structures and so-called graphic formulæ are used largely to express their composition. Organic C. enters into and has a profound bearing upon modern civilisation. Many drugs and medicinals which can only be obtained with difficulty from natural sources can be synthesised in a state of purity. The enormous dyestuff industry of the world has been built up largely upon the 'intermediate' compounds prepared from benzene, toluene, naphthalene and anthracene, which are aromatic hydrocarbons obtained usually from the tar produced when coal is destructively distilled in gas-retorts or coke-ovens. The dyestuffs, of which there are thousands, mostly laboratory products, are used to colour food, clothes, shoes, paints, artificial silk—itsself an organic substance—inks, paper, and in fact most of the coloured objects used in everyday life, may be said to have emerged from the effort of Sir W. H. Perkin, who, in 1856, made the first aniline dye, 'aniline purple' or 'mauveine.' Most of our modern explosives, of which tri-nitrotoluene or T.N.T. is an example, are also organic bodies. Organic C. is a fascinating branch of science, the possibilities of which are practically limitless.

Physical Chemistry.—Although of very recent development this is now an absolute essential to the study of any

branch of C. with any design. It seeks to explain processes, and to formulate laws for these processes, and is divided within itself again into electro- and thermo-C., etc. One branch of physical C. in which great strides have been made is the study of the general properties of gases. It is really as much in the realm of physics as it is in the realm of C. In this we may start from Charles's law, *'That when a gas is heated, the pressure being constant, it increases in volume to the same extent whatever the gas may be.'* This law is not quite accurate, in fact physical C. has found the co-efficient of expansion of sev. of the gases. That of air is 0.003665, and from this the absolute temp. is stated as being -273° C. This law, together with Boyle's law, *'The volume occupied by a given weight of gas is inversely as the pressure,'* give a basis to this branch of the science. Boyle's law is not absolutely correct either. All gases except hydrogen require less than this theoretical pressure to reduce them in volume, while hydrogen requires more than the theoretical pressure to do so. This deviation is explained by the kinetic theory of gases, which regards gases or vapour as molecules held together by the smallest possible force of attraction. These molecules are supposed as in a state of violent motion, moving in straight lines until they strike against other molecules or the sides of the containing vessel, when they rebound or continue in another direction. The energy remains the same with constant temp., but any increase in temp. results in an increase of energy or speed, a decrease of temp. naturally causing the opposite. The pressure of the gas is the effect of this bombardment of the sides of the vessel, and is proportionate to the sum of $\frac{1}{2}$ mass of each molecule multiplied by the square of its velocity. If the confining space be reduced, the pressure is increased because the number of impacts is increased. Thus if the space be reduced one-half the impacts, and consequently the pressure, is doubled. This, of course, is Boyle's law. Again, heating a gas causes the temp. to rise, and since by Avogadro's hypothesis equal volumes of gases contain the same number of molecules, the increase in kinetic energy would be the same in any gas subjected to the same range of temp. Now since molecules of different gases have different weights, and since the pressures and consequently the energies of all gases are the same at the same temp., and since the energy is $\frac{1}{2}mv^2$, where m = mass of a molecule and v = velocity, it follows that the velocities of molecules of different gases must vary. Calculations bring these velocities out as being proportional to the inverse square roots of their densities. Now it is a well-known fact that gases (and liquids) diffuse, i.e. will gradually pass through partitions if there be partitions, and will mix. Thus if an explosive mixture of hydrogen and oxygen be passed through porous tubes, then, by the time they reach the far end, the hydrogen will have diffused so much that a glowing splinter will re-ignite, the gas being mainly oxygen. Graham

estab. a law which took note of the well-known fact that light gases diffuse more rapidly than heavy gases. His law is: *'The relative velocities of diffusion of any two gases are inversely as the square roots of their densities.'* The same result was arrived at, as shown above, by a study of the kinetic theory of gases. From this it will be seen that while Charles's and Boyle's laws are upheld by this theory, yet, since molecules are not mathematical points, and since impact occupies time, and that, further, since there must be some slight attraction between the molecules themselves, then there must be some deviations. Furthermore, there is one point at which both laws absolutely break down. If a gas be cooled from 0° C. to -10° C., theoretically by Charles's law 100 c.c. of it should be reduced to 96.4 c.c. But in the case of sulphur dioxide instead of occupying 96.4 c.c., a liquid will have been formed and only a few c.c. of gas will remain. This, of course, is a development not accounted for in the law. Similarly by Boyle's law 100 c.c. of a gas at standard pressure should occupy 25 c.c. at a pressure of 4 further atmospheres. On the contrary, at a pressure of 4 atmospheres, sulphur dioxide gas breaks down into a liquid. And it is in this branch of the liquefaction of gases that physical science has perhaps made greatest strides. Chemical apparatus has been brought to such a pitch that temps. approaching absolute temp. can be reached. All gases now with the exception of hydrogen can be liquefied when subjected to certain conditions of temp. and pressure, which vary for different gases. Northmore in 1806 was the first to liquefy gases, and the gas that he used was chlorine. Faraday was the first, however, to recognise the fact that it was liquid chlorine. An interesting application of this subject was the liquefaction of helium, which requires the lowest temps. This gas, together with argon, krypton, and xenon, forms a remarkable group. They occur in the atmosphere and in certain rare metallic ores, and their discovery is chiefly due to Sir Wm. Ramsay. Radium, which has opened up an entirely new field in C., also emanates helium rays, which can be collected. A further dept. of physical C. which has received great attention is that of the theory of solutions. It has been estab. that the pressure exerted by a substance in dilute solution (its osmotic pressure) is the same as would be exerted by the same amount of the substance if it existed as gas, and occupied the same volume at the same temp. Much research has been carried out on what is known as the colloidal state. This may be regarded entirely from the point of view of size of particle. The particles are of greater molecular dimensions than exist in true solutions, and yet sufficiently small to be kept in suspension, against the action of gravity, by molecular bombardment. Such particles represent an enormous surface area and to this fact many of the properties characteristic of the colloidal state are due. Further the laws relating

to gaseous pressure are similar to those relating to osmotic pressure, and diffusion of dissolved substances can be compared with the diffusion of gases, although it is a much slower process. This theory involves the theories connected with electrolysis, for solutions of some substances act in such a manner that it is necessary to suppose that molecules of the dissolved substances unite in solution to form complicated molecular structures, while in the case of certain acids, bases, and salts, their resultant action can only be explained on the hypothesis that their molecules dissociate into ions (see below).

plate, while an electric current will pass along the wire. The liquid through which the current must pass is known as the electrolyte, and the poles in the electrolyte are known as electrodes, the negative being the cathode, and the positive the anode. It will be sufficient for the purposes of this article to mention that the theory of electrolytic dissociation at present held is that it involves a flow of electrons. If an aqueous solution of copper sulphate be electrolysed the primary products may be supposed to be copper Cu, and the radical SO_4 . The copper is deposited on the negative



Imperial Chemical Industries

PLASTICS: AN ACHIEVEMENT OF MODERN CHEMISTRY

One of the most interesting and important of the synthetic plastics is the acrylic resin 'Perspex,' made by chemical reactions between acetone, hydrocyanic acid, wood alcohol or methanol, and sulphuric acid. The photograph shows 'Perspex' cocktail-glasses.

Dissociation is a term used of reversible reactions. Thus chalk on heating will split up into lime and carbon dioxide. But the lime and the carbon dioxide can reunite to form chalk. That fact may be expressed thus: $CaCO_3 \rightleftharpoons CaO + CO_2$. Decomposition, on the other hand, refers only to reactions which only take place in one way. As, for example, $2NH_3 = N_2 + 3H_2$, signifies that ammonia on heating is decomposed into nitrogen and hydrogen, and not that nitrogen and hydrogen recombine to form ammonia. The conception of ions in C. is a branch of electrolysis. An electric battery is formed if strips of zinc and platinum be placed in dilute sulphuric acid always provided that a metal wire outside joins the plates. The zinc dissolves in the acid and bubbles of hydrogen are evolved at the platinum

electrode, and the SO_4 group passes to the positive pole, where it is decomposed by the water into oxygen, which is liberated, and sulphuric acid. Thus $SO_4 + H_2O = H_2SO_4 + O$. The primary factors in electrolysis, for example in this case copper and SO_4 , are known as *ions*. Those which proceed to the positive pole are negatively charged, and vice versa. Among electronegative ions may be named fluorine, chlorine, bromine, and acidic radicals such as SO_4 , while electropositive ions include hydrogen and the metals. Among the laws of electrolysis may be mentioned Faraday's, which says that if the same quantity of electricity be passed through different electrolytes, then the ratio between the liberated products of the electrolysis is the same as that between their chemical equivalents. It

used to be supposed that the electricity caused the dissociation of the electrolyte into ions, but it has been shown that electricity travels as freely through electrolytes as along metals, and that consequently work is not done. Arrhenius (1887) proposed that some of the molecules of an electrolyte are always in a state of dissociation. A development of this theory leads to the conclusion that a solution, say, of sodium chloride has sodium and chlorine existing in the free state within the solution. This goes against all preconceived ideas, particularly as sodium causes immediate chemical action if brought into contact with water. To support this theory, however, they must be in such a state and highly charged with electricity. Whenever they lose their charges they either reunite into sodium chloride or form molecules of sodium and chlorine and assert their usual properties. It is now believed that electrolytes consist not of molecules but of assemblages of ions, even in the solid state. Solution merely sets the ions free to move, and passage of a current directs their movement. Thermo-C. is concerned with the thermal changes which accompany chemical changes. Determinations in this branch of the science are made by means of calorimeters in which the heat that is liberated in chemical action is transferred to definite volumes of water, and its application chiefly lies in its efficacy for determining economic commercial processes. The structure of the atom is, of course, of fundamental interest and importance to chemistry, but the methods employed in this study are almost entirely physical. Finally, it may be stated that a knowledge of C. is evidently essential in many walks of life, whether it be the surgery, the kitchen, the dairy, the farm, the factory, the mine, or the great iron and steel industries. The arts and, of course, the great chemical and dye works are dependent upon it, and it stands out as the first study in any scheme of technical education.

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Chemnitz, important manufacturing town of Saxony, Germany, situated in a fertile

valley at the base of the Erzgebirge, about 45 m. S.W. by rail from Dresden. Chief industrial tn. of the state, it is noted for the manuf. of cottons, woollens, silks, leather goods, locomotives, machinery, and agric. tools. Its many buildings of interest included the Old Rathaus in the Hauptmarkt, the Neumarkt, the church of St. James, etc. There are fine technical schools, as well as schools of engineering, agriculture, and commerce. The tn. was created a free imperial city in 1125, when Emperor Lothaire founded in it a Benedictine monastery. It received municipal rights in 1494. The tn. suffered during the Thirty Years war, but later became a cotton manufacturing centre. C. suffered severely in the Second World War from allied bombers in Jan.–March, 1945 particularly in co-operation with Marshal Koniev's invasion of Silesia. It fell to Gen. Patton on April 19. Pop. 351,000 (1943).

Chemnitz, or **Kemnitz**, **Martin** (1522–86), staunch Lutheran divine, son of a cloth-worker, b. at Treuenbrietzen in Brandenburg, followed his father's trade, but soon abandoned it, and became a student at the univ. of Frankfurt-on-Oder, thence to Wittenberg, where he came under the influence of both Luther and Melancthon. He soon gained attention as a brilliant orator and able controversialist. He was bitterly opposed to the Jesuits, and inveighed against them in many pamphlets, chief amongst which are his *Theologia Jesuitarum precipua capita* and his *Eramin concilii Tridentini* (1563–73). He was recognised as the head of his church throughout Saxony.

Chemnitz, **Bogeslaus Philipp** (Bogeslaw von) (1605–78), a Ger. historical and political writer, grandson of Martin C. (q.v.). He served as an officer in the service of Sweden during the Thirty Years war, becoming historiographer to Queen Christina in 1644, councillor in 1675. His *Dissertatio de ratione status in imperio nostro romano-germanico* appeared in 1640 under the pseudonym, of 'Hippolytus a Lapide.' C. also wrote *Der königlich schwedische in Deutschland geführte Krieg*, 1648 (new ed. 1855–59). The *De Ratione* was answered by an anonymous writer, 1657; by Bruggemann, 1667; and Boecker, 1674. It was trans. into Fr. by de Chastelet, 1712; by Forney, 1762.

Chemnitzia, term sometimes used for *Pseudomelania*, a large genus of marine gastropod molluscs which resemble the elongated fresh-water *Melania*. The species occur fossil in the Trias and Jura and less frequently in Cretaceous and Eocene.

Chemosh (god of Moab), national deity of the Moabites, and was designated by the Israelites as the 'abomination of the Moabites.' The Moabites were also called the children of C. (Jer. xlviii.). This god's name frequently occurs in the O.T., and is found engraved on the Moabite stone (q.v.). The sacrifices sometimes consisted of human victims. Solomon was guilty of having idolised this deity by building an altar to him, nor was it pulled down until Josiah's accession.

Chemulpo (Kinsen), port on the W. coast of Korea, was opened to foreign trade in 1883 when it was a poor fishing vil.; it was later a flourishing and rapidly increasing centre of trade with a pop. of 103,000 (Jap. 25,000).

Chemung, name given by Amer. geologists to a div. of the Devonian.

Chenab, riv. of Kashmir, India, and E. Punjab, Pakistan. Together with the Sutlej, Beas, Ravi, and Jhelum, it forms the R. Punjab or Panjnad (Five Waters), which finally flows into the Indus. When the C. reaches the Punjab dist., it attains to a breadth of 600 ft. It takes its rise in Lahul at an altitude of nearly 14,000 ft. It is 590 m. long.

Chencanfu, tn. of Kwangsi prov. in S. China.

Chenchine, Afanasi, see FET.

Chenchowfu, or Shenchow, tn. of central China, Hunan prov., on the Yuenkiang trib. of the Loikiang, 169 m. from Changsha, 110 m. from Lake Tungtinghu.

Chénédollé, Charles Julien Lioult de (1769-1833), Fr. poet who fought in the army of Condé against the revolutionaries. His prin. works are *Le Génie de l'homme* (1807) and *Études poétiques* (1820). He belonged to the romantic school of poets, and his works were ed. by Sainte-Beuve in 1864, who has also paid tribute to his memory in his *Chateaubriand et son groupe*, 1860.

Chênée, tn. situated at the conjunction of the Ourthe and Vesdros in the prov. of Liège, Belgium. Pop. 10,000.

Chenery, Thomas (1826-84), distinguished Eng. scholar, also editor of *The Times*, after appointment he received in 1877. He was a student of Caius College, Cambridge, and served in the Crimea as war correspondent to *The Times*. He had an excellent knowledge of Arabic and Heb., and was one of those appointed to revise the O.T.

Chenevix, Richard (1774-1830), Irish writer, chemist, and mineralogist, of Fr. parentage, F.R.S. of London and Edinburgh. He was a Copley medallist in 1803. Among his scientific words are *Chemical Nomenclature* (1802), and *Observations in Mineralogical Systems* (1808). He also wrote the comedy *Mantuan Revels*; the tragedy *Henry VII.* (1812); *Essay on Natural Character* (1830); papers on palladium, nickel, and platina; *Leonora*, and other poems.

Chengalpat, see CHINGALPAT.

Chengchow, city of China, Honan prov., 80 m. from Kaileng.

Chengteh, see JENIOL.

Chengtu, cap. of prov. of Szechwan in China, situated in a fertile plain watered by the Min, a trib. of the Yangtse. It is the seat of the W. China Univ. The pop. is estimated at over 400,000.

Chengyangkuan, tn. in the prov. of Anwei, China; noted for its market.

Chénier, André Marie (1762-94), Fr. poet and miscellaneous writer, son of the Fr. consul at Constantinople, his mother being Gk. He was educated at the Collège de Navarre, and began to write verse at the age of sixteen, with imitations of Homer and Virgil. He held at one

time a commission in the army, but soon threw it up and devoted himself to literature. He wrote many idylls and elegies, which show his powers as poet. Singularly chaste in style, he approached the Gks. in their powers of eloquence and choice selection of words. He was largely influenced by Milton, whose classic style he sought to imitate. In 1787 he accepted a post in the Fr. embassy in London, but after three years returned to France, where, after joining the revolutionary movement for a short time, he threw in his lot with the Moderate party, being disgusted with the extreme methods adopted by the revolutionaries. Most of his political writings appeared in the *Journal de Paris*, among the most important being one dated Feb. 26, 1792, entitled *De la cause des désordres qui troublent la France, et arrêtent l'établissement de la liberté*—a manifesto against the Jacobins. His *Arts aux Français sur leurs véritables ennemis* also drew upon him the malevolence of the Jacobins. When his party was defeated and the king executed, he paid for his outspokenness, was arrested and thrown into the St. Lazare prison, and guillotined four months later. C. is regarded as the foremost Fr. poet of the eighteenth century. A classicist, he differed only from the great classicists in that he was more of a Hellenic than they--a trait which he owed to his Gk. mother's influence. The only long works he projected were in the spirit of the eighteenth century and belonged to the Encyclopédic movement. The best known of his classical pieces are *La Jeune Tarentine*; *L'Aveugle* (on the legend of Homer wandering and blind); and *Le Jeune Malade*. Of the odes the best known are the *Pindaric Jeu de Paume* and one addressed to Charlotte Corday. The *Iambes*, which contain some of his finest poetry, were all written during his incarceration in St. Lazare. In style his importance lies in his use of *enjambement* (running of the sense into the next line) and he was the first since the *Pléiade* (q.v. and see also RONSARD), with which group he has some features in common, who in this manner systematically modified the somewhat monotonous uniformity of the Alexandrine so as to lend it more flexibility. His works on scientific questions or current problems include *L'Amérique* (planned as a poetic geography of the known world); *L'Hermès* (a universal philosophy in verse); *L'Astronomie*; *La Superstition*; and *L'Invention*, later works which show a deeper skill in literary craftsmanship. His *Poésies lyriques* were pub. after his death in 1819. See P. DUMOL, *La Vie et l'œuvre d'André Chénier jusqu'à la Révolution française*, 1762-90, 1936.

Chénier, Marie Joseph Blaise de (1764-1811), brother of André, was a Jacobin, and served in the legislative assembly for a period of thirty years. He was both a poet and dramatist with a large output of work. C. was a keen politician with democratic principles, which account largely for the popularity of his tragedies, chief amongst which are his *Charles IX.*

(1790); *Henry VIII.* (1791); *Jean Calas* (1791); and *Timoléon* (1794). He became a member of the Convention, and was on the Council of Five Hundred. He was distinguished for his satires, amongst which may be mentioned his *Épître à Voltaire* (1806).

Chenille, special kind of pile yarn used in millinery manuf., curtains, and carpets. It may be of silk or worsted according to the purpose required. It is made by weaving a gauze cloth of very open texture which is then cut into strips and finished off into a rounded-pile thread.

Chenonceaux, vil. in the dept. of Indre-et-Loire, situated in central France and watered by the R. Cher. Its château, situated on the r. b. and with a wing

basal ovule; there are no stipules, and the fruit is a nut or an achene.

Chenopodium, important genus of Chenopodiaceae, contains numerous plants growing in a temperate climate, and many of them are endowed with extraordinary names, e.g. fat hen, lamb's quarters. There are nine Brit. species, usually known as goosefoot, which grow in waste places as weeds; they are insipid and of little value, but the leaves and young shoots may be eaten as spinach. *C. bonus-Henricus*, good King Henry, Eng. mercury, or wild spinach, is a Brit. perennial of which the shoots are eaten like asparagus. *C. oldum* and *C. Vulvaria* are both known as the stinking goosefoot, and *C. album* is the white or



THE CHATEAU OF CHENONCEAUX

D. McLeish

stretching over the riv. is of great historical interest. It was built in 1515 in Renaissance style, and passed through many hands. It had been confiscated by Francis I. in 1535; presented by Henry II. to Diane de Poitiers, and taken from her by Catherine de' Medici; occupied by Henry III.'s wife; by the house of Vendôme; and by the Bourbon-Condé family. Claude Dupin (1684-1769), celebrated for his hospitality, also owned it for a time.

Chenopodiaceae, fairly large family of Dicotyledons, contains numerous species used either for culinary purposes or for the manuf. of soda; spinach, beet, orach, goosefoot, sea blite, and saltwort are examples of the family. All are characterised by their salt-loving tendencies, and frequent seashores. Most of the plants are herbaceous, with dense inflorescences of small flowers. There is usually a simple, persistent perianth of sepaloid leaves, one to five in number, the stamens typically equal the perianth-leaves in number, the ovary is superior and unicellular with a single campylotropous,

common goosefoot, an ann. plant eaten like spinach. *C. Quinoa*, the celebrated quinoa of Peru, is an important food-plant of S. America; it is grown on land where neither barley nor rye will ripen, and the seeds are used much as is rice in India. *C. anthelminticum* (or *ambrosioides*), the wormseed or Mexican tea has an aromatic odour; in medicine it forms a well-known vermifuge and as an article of diet it takes the place of tea.

Chenyuen, tn. in the prov. of Kweichow, China, 100 m. E.N.E. of the cap., Kweichow. It is noted for its gold and copper mines.

Cheops, king of Memphis, Egypt, who reigned second in the fourth dynasty of Manetho; celebrated for being the builder of the Great Pyramid. This colossal sepulchre was built at the cost of much human suffering, and at enormous expense. According to Herodotus, all the Egyptians were put to work in relays of 100,000 working for three months, quarrying, constructing the road for transport, and preparing the site. All this work took ten years, and the work of

building the pyramid twenty years more.

Chepman, Walter (c. 1473-c. 1538), printer and merchant of Edinburgh, one of the first Scottish printers. He was introduced to the court of James IV., and was trained as a clerk and writer under Panter, the royal secretary. C. and Andrew Myllar were granted the sole patent to print books in Scotland (1507). They set up their printing-press (the first in Scotland) at the foot of Blackfriars Wynd in the Cowgate, Edinburgh. Two of their pubs. remain, one, the first book printed in Scotland, consisting of eleven small quartos bound together (1508), the other *Breviarium Aberdonense* (1510). See introduction by D. Laing, *The Chepman and Myllar Prints, 1508, 1827*; R. Dickson, *Introduction of the Art of Printing into Scotland, 1885*.

Chepping Wycombe, see HIGH WYCOMBE. **Chepstow**, seaport tn. of Monmouthshire on the R. Wye, near its junction with the Severn. The tn. lies on a slope between steep cliffs, and is surrounded by beautiful scenery. It possesses the ruins of a castle which sustained sev. sieges during the Great Rebellion, and in its neighbourhood are the remains of the famous Tintern Abbey. The Wye is crossed near here by Brunel's tubular suspension bridge, and here occur the highest tides in the Brit. Isles, the water sometimes rising 70 ft. above low level. Some shipbuilding is carried on, and the chief exports are timber, iron, coal, cider, and millstones. Pop. 4600.

Cheque, money order on a banker drawn out by a person who has money in the bank, and payable on presentment by the person to whom the C. is written out or by the bearer. The rules with regard to a bill of exchange (*q.v.*), defined in the Bill of Exchange Act, 1882, are also applicable to Cs. A C. must bear a two-penny stamp, and must be signed by the drawer. Before payment, it must be endorsed on the back by the recipient. It must be presented within a reasonable time. A banker who pays a forged C. cannot debit his customer with the amount. When the amount is fraudulently altered, the banker who pays it can recover from his customer only the amount originally placed thereon. Negligence on the part of the customer causing or giving facilities for fraud may excuse the banker, if it be gross; but merely leaving one's C. book in an unlocked drawer will not *per se* be sufficient for this. Bankers paying on forged endorsements stand on somewhat different footing. A banker who pays in good faith and in the ordinary course of business a C. on himself to order on demand, bearing a forged endorsement, will not be held liable to his customer for the amount (Section 60, Bills of Exchange Act, 1882—a section which protects only bankers). The banker is bound to pay the C. on demand, except in cases when the drawer has previously given notice to him not to pay on his account, or when the drawer has d. or committed an act of bankruptcy. In England Cs. may be crossed in order to

lessen the risk of loss by theft or fraud. A *crossed C.* has two parallel lines drawn across it, in which may be written a particular banker's name, or merely the words '& Co.' In the former case, it is said to be *specifically* crossed, and will only be paid through the banker mentioned. When it is *generally* crossed, it is payable only through a bank. If the words 'not negotiable' are added, the person taking the cheque does not have and cannot give a better title to it than that of the person from whom he took it. Cs. are returned, after payment, by the banker to the person who originally drew them, and, as every C. is endorsed with the receiver's name, it is evidence of payment in the absence of a proper receipt.

Chequers, popular name for C. Court, a country mansion and estate in Buckinghamshire, England, the official country residence of Brit. Prime Ministers. The house is situated in a sheltered hollow of the Chiltern Hills at nearly 700 ft. above sea level, and its grounds contain Coombe Hill, 852 ft., one of the highest points in the Chilterns. The estate, which lies near Princes Risborough, is about 38 m. from London, and contains 1500 ac. of farmlands and woods. The nation owes this picturesque and historic mansion to the munificence of Lord Lee of Farnham, who in 1917, when Sir Arthur Lee, M.P., created a trust for the upkeep, staffing, etc., of the house and estate for the use, on his death, of Brit. Premiers. In 1920 he decided not to await that event, and on Jan. 8, 1921, Mr. Lloyd George first occupied the residence. The mansion is Elizabethan, and contains a collection of Cromwell portraits and relics.

Cher: 1. Fr. riv. about 220 m. long, flowing generally N.W., and joining the Loire about 12 m. below Tours. It is navigable from Vierzon. The riv. gives its name (2) to the central dept. of France. The climate of the dept. is temperate; the surface generally level and well wooded; the soil fertile and productive of corn, wine, fruit, hemp, and flax. Horses, sheep, and cattle are reared, and bee-keeping is a popular industry. There are iron and coal mines, and quarries of marble. The chief manufs. are woollen goods, cutlery, porcelain, brick, and glass, but the chief occupation is agriculture. C. is divided into two arrons.: Bourges, Saint-Amand-Mont-Rond. The cap. is Bourges. Area 3770 sq. m. Pop. 286,070.

Cherasco, com. of Cuneo, a S. prov. of Piedmont, N.W. Italy. The prin. industry is silk-weaving. One of the tns. was embroiled in the Napoleonic wars, when its fortifications were razed to the ground by Fr. troops in 1801. Pop. 8700.

Cherbourg, fortified seaport tn. and naval station in the dept. of Manche, France, situated at the head of the peninsula of Cotentin, 85 m. W. of Havre. It has tribunals of the first class, and is the seat of a sub-prefecture. It is the headquarters of one of the five naval arrons. of France, and possesses a lycée and a naval school. Its prin. industry is centred in the works of the dockyard, but there are manufs. of hosiery and lace, chemicals and

leather, as well as sugar and salt refineries, sawing and flour mills. Nothing certain is known of the origin of C., but a common supposition is that it occupies the site of the Rom. station of *Corialtum*, and the name C. was long regarded as a corruption of *Cæsaris Burgus*. The tn. certainly existed in the tenth century. In the eleventh century, under the name of Carusbur, it was a favourite resort of the Norman kings of England. In 1686 Vauban planned the harbour works, which were continued under Napoleon I., but not finally completed until 1856, when they were formally inaugurated by Napoleon III. in the presence of Queen Victoria. Thirty years later the gov. expended 49,000,000 francs on the construction of fresh works. The commercial and naval ports are quite distinct from each other. The latter consists of three basins cut out of the rock, 55 ac. in area with a minimum depth of water of 30 ft. Adjoining are dry docks and some of the largest shipbuilding yards in France. The bay is sheltered on the N. by a huge *digue*, or breakwater, 24 m. from the harbour, over 2 m. long, 650 ft. wide at its base, and 30 ft. at its summit. The passages for vessels on the E. and W. of the *digue* are protected by batteries, the chief being Fort National with 100 guns on the Il. de Pelée, and there is a fort in the centre of the breakwater. A series of coast redoubts and large fortifications behind this outer ring of defence renders C. almost impregnable from the sea. In the Second World War the Port Militaire and the Gare Maritime were heavily damaged, and the naval arsenal completely destroyed. The Allies captured C. by a land attack up the Cotentin Peninsula. Amers. entered C. on June 25, 1944. See further under WESTERN FRONT IN SECOND WORLD WAR, *Battle of Normandy*.

Cherbuliez, Charles Victor (1829-99), son of André C. (a well-to-do Genevan bookseller who became prof. of Lat. and of anet. literature at the Genevan Academy), distinguished for his interesting works of fiction. He was b. at Geneva, and studied philosophy, philology, and mathematics, visiting the following places in the course of his studies, viz. Paris, Bonn, and Berlin. He was first a teacher, and afterwards wrote, besides his works of fiction, thoughtful essays on various topics. His novels are a blend of narrative and philosophic reflection, and the amusing, if eccentric, originality of their style appealed to a large class of readers. Some of his most popular novels are *Le Prince Vitale* (1864), *Samuel Brohl et Cie* (1877), *Noirs et rouges* (1880); and *Le Secret du précepteur* (1893), most of which appeared in the *Revue des deux Mondes*. He also contributed political and serious articles, such as *L'Art et la nature* and *L'Espagne politique* (1874). His works were very popular in other countries.

Cherchel, see CASAREA.

Cheremisses, Finnish race settled in some parts of E. Russia. It is very exclusive, and is composed of two

different types, some being fair and others being very dark. Its religion is of a mixed character, elements of Christianity being mingled with Mohammedanism.

Cheremkovo, tn. of the Irkutsk region of the R.S.F.S.R. (E. Siberia) in the Cheremkov Basin, a rich coal area. It has a calcium carbide industry. Pop. 66,000.

Cherepovetz, tn. of the Leningrad region of the R.S.F.S.R., with manufs. of agric. implements and boots and shoes. Pop. 25,000.

Cherethites and **Pelethites**, these two tribes formed the royal bodyguard of King David, and were probably Philistines. The Gittites, who were Philistines, were also coupled with these other tribes in serving as a protection to the king. It has been suggested that C. is another form of Carites or Cretans, for it is surmised that the Philistines came from Caphtor, which is identified with Crete. These tribes were particularly loyal to David in all his manifold dangers. Proceeding further along in scripture, the officers of the Carites were instrumental in bringing about Athalia's downfall, and in making Joash king. There is no certain indication of their existence after the first years of the reign of Solomon. (The C. were settled in the Negeb (I Sam. xxx.). In the R.V. they are called Carites.

Cherhill, a par. in the co. of Wiltshire in England, lying 12 m. S.W. of Swindon. The figure of a horseman is sculptured on one of the slopes of the chalky hills. Pop. 251.

Cheribon, residency possessing a seaport of that name in Java, E. Indies. The dist. is very fertile, having an extensive trade in coffee, cotton, indigo, and teak-wood.

Cherimoyer, or **Cherimolia**, edible fruit of a Peruvian downy-leaved species of Anonaceae closely allied to the custard-apple of the W. Indies. The fruit is obtained from *Annona Cherimolia*, and is much esteemed by the people of the W. parts of S. America. Its cultivation has spread to Central America and to Europe, India, and Africa.

Cherith, Brook of, the brook 'before,' i.e. E. of, the Jordan (1 Kings xvii.). Elijah's hiding-place during the first part of the three years' drought.

Cheriton, par. of E. Kent, England, 3 m. N.W. of Folkestone, of which it may be said to form a suburb. Pop. 6995.

Cherkassy, tn. of Ukrainian S.S.R., in the Kiev region. It is situated on the r. b. of the R. Dnieper, 96 m. S.E. of Kiev. It was an important tn. of the Ukraine, under Polish rule, till 1648, the year of the revolt of Chmielnicki. In 1795 it was annexed by Russia. Agriculture is the chief industry; there are distilleries, and manufs. of sugar and tobacco. Pop. 53,000.

Cherleria, genus of Caryophyllaceae, usually included in *Arenaria*, contains a single species in Britain. This is the cyphel, or *C. redoides* of Linnaeus; the plant is Alpine, and now bears the name *Arenaria C.*

Chermes, or **Kermes** (Arabic *qirmiz*,

a little worm, from Sanskrit *krimi*, a worm), gall-forming genus of insect which causes much damage to forest conifers. The trunk and twigs or leaves of a C.-infested tree appear more or less covered with a white flock, like tufts of cotton. This fine flock consists of threads thrown out by the insects from abdominal glands, with which they cover and protect themselves. The most serious damage is caused by females of *C. abietis* hibernating in young shoots of the spruce and laying eggs; for this process is followed by abnormal growth and the grubs creep into the spaces between the swollen leaf bases and there is then formed a gall like a cone, with needle-tips sticking out from it. This gall is completely closed while the grubs go through their metamorphosis, and the mature insects eat their way out and fly to the larch, where they live and lay eggs on the needles. The death of the twig follows on gall formation and the quality of the timber is always impaired. The colouring matter, kermesic acid, obtained from the dried bodies of these insects, dyes cloth a dark red.

Chernigov: 1. Region of the Ukrainian S.S.R. It covers an area of about 20,233 sq. m. The country is level, but there is higher land near the Dnieper and in the S.W. Agriculture and cattle grazing are two important industries, and there is trade in timber, hemp, flax, tobacco, honey, and wax. Fruit is also grown. Its manufs. are linen, glass, and beet sugar, and the minerals found are saltpetre, iron, slate, and alum. 2. Tn. and an archiepiscopal see in S.W. Russia, cap. of the region of the same name, situated 20 m. from Kiev, near the Desna, a trib. of the Dnieper. Before the Second World War it had extensive factories for the making of candles, soap, bricks, carriages, and cables. The chief trade was in salt, sugar, cereals, stone, and wood. There is some oil production. Interesting excavations were carried on near by between the years 1873 and 1877. Pop. 68,000.

Chernovitsi, see CERNAUTI.

Cherokee, tn., C. co., Iowa, U.S.A., on Little Sioux R., 50 m. from Sioux City. Noted for its medicinal springs. Pop. 7400.

Cherokees (native *Tsalgi*, cave people), tribe of N. Amer. Indians of the Appalachian stock, numbering 25,000. They formerly possessed a large tract of land on either side of the S. Appalachian Mts., which they cultivated as excellent and prosperous farmers. They sided with the Eng. in most of the disputes between the European colonists and with the Royalist party in the revolutionary war. The failure of the Royalist party led to their subjugation by the new republic and the loss of a large part of their ter. The increasing number of white settlers led to disputes with the original owners of the land, and those who had not already moved were driven to their present position in the N.E. corner of Oklahoma, while others live in Tennessee, by Gen. Winfield Scott in 1838. The C. are considered the most civilised

of all N. Amer. Indians. Many of them have become Christians; they have a written alphabet of eighty-five characters invented in 1821 by George (Guss, or Sequoyah, a half-breed. Until 1906, when tribal rule virtually ceased, they had a constitutional gov., consisting of an elected chief, a senate, and a house of representatives, with their cap. at Tablequah.

Cherra Punji, vil. in Assam dist., India, in Khasi Hills. It has the heaviest known ann. rainfall in the world, the average for twenty-five years being nearly 500 in. per annum.

Cherry, name given to various species of the genus *Prunus* of the order Rosaceae and sub-genus *Cerasus*, to which belong the plum apricot, almond, sloe,



and other well-known fruit-bearing trees. The C.-trees differ from the plum-trees very slightly, and there is little to distinguish them from one another beyond the folding of the leaves in the bud—in the C. they are flat, in the plum rolled up. The fruit in both cases is stony and is termed technically a drupe. From early times the C. has been cultivated for its edible fruit, and Lucullus, the epicure, is said to have brought it into Europe. *C.* (or *P.*) *Arium*, the wild C., *gean*, or hedge-berry, and *C. vulgaris* (or *P. Cerasus*), the common dwarf or morello C., are the two species from which all the Brit. varieties are believed to have been derived. The former is a native of W. Asia and the woods of Europe, while the latter acquires a very large size in the woods of Asia Minor. *C. chamaecerasus*, the ground C., a dwarf species, never rising above 3 or 4 ft. high, is common to Lower Austria, Hungary, and Siberia; *C. nigra*, the black Amer. C., is a handsome tree with loose umbels of pinkish flowers; *C. serrulata*, the fine-toothed C., is a native of China, and in our gardens bears double flowers; *C. depressa*, the sand C., grows well in N. America, and in Britain is a handsome, but short-lived bush; *C.*

prostrata, the spreading C. is a small prostrate bush which brightens the rocks of Dalmatia, Candia, and Asia Minor with its pink blossoms; *C. (or P.) Japonica*, the Japan C., is a beautiful plant with double flowers which appear in Great Britain in March. In all the above species of true Cs. the leaves come out later than the flowers, but in the bird Cs. the racemes of flowers appear after or at the same time as the leaves. Of these may be mentioned *C. Mahaleb*, the Mahaleb or perfumed C., a sweet-smelling shrub with a bitter and nauseous fruit; *P. Padus*, the common bird C., a species which grows wild in the woods and hedges of central Europe; *C. virginiana*, the choke C., a large tree with shining deciduous leaves, used in cabinet-making in N. America; *C. Capollim*, the capollim or Mexican bird C., which has a pleasant-smelling fruit, while the bark is reputed to be a valuable febrifuge. The C. laurals are allied to the bird Cs. and true Cs., and are distinguished from them by having evergreen leaves and long racemes of flowers which appear with the leaves. *C. Caroliniana*, the evergreen or Carolina C. laurel, is an ornamental tree with poisonous leaves; *C. Laurocerasus*, the common or broad-leaved C. laurel, is a hardy evergreen much cultivated in Brit. shrubberies and is remarkable for the amount of hydrocyanic acid secreted in its leaves; *C. lusitanica*, the Portugal laurel, a native of Portugal and the Canaries, flourishes in Britain, where it is readily propagated from its abundant fruit.

Cherso, long and narrow is. of Italy in the gulf of Quernero. Sheep are pastured there, and its chief products are wines and fruit. It covers an area of 127 sq. m. About half the pop. live in the chief (cathedral) tn. of C. on the W. side, the chief industries there being fishing and boat-building. Pop. of entire place 8570.

Cherson, see **KHERSON**.

Chersonesus (Gk. Χερσόνησος, a continent is., i.e. a peninsula), anc. name of sev. peninsulas in Europe and Asia, the most important being C. Taurica, or Scythica (Crimea), C. Cimbrica (Jutland), C. Thracia (Gallipoli), C. Aurea (Malay). By the C. Thracia was generally meant by the Athenians. See **CRIMEA**, **GALLIPOLI**, **JUTLAND**, and **MALAY**.

Chert, variety of quartz which occurs in limestone in much the same way as flints occur in chalk, though it occurs in tabular masses rather than in nodules. Its formation is due to what is called concretions; that is to say, silica derived from sponges passed into solution, then filtered down through the calcareous ooze, and was reprecipitated when conditions were suitable for the deposition of the silica and the solution of the limestone. Thus in certain localities in the limestone the calcium carbonate has given place to silica. C. occurs in a variety of colours (grey, white, red, yellow, and brown), is coarser than flint, and is generally more brittle. The coarser varieties are called hornstone.

Chertsey, tn. in Surrey, on the r. b. of the R. Thames, 25 m. W.S.W. of

London. The riv. is crossed here by a seven-arched bridge. C. possesses the remains of a famous abbey, in which Henry VI. was buried, and an endowed charity school. Its chief trade is in malt and flour, and in garden produce for the London market. The poet Cowley d. there and Charles James Fox lived at St. Anne's Hill, a mile away. Pop. 17,000.

Cherubim, plural of the Heb. word cherub (*kērub*). It is very difficult to understand clearly what C. were supposed to be like, as there is such a variety of notions. According to parts of the Scriptures they are imaginary winged animal figures, and there is an especially fine description of them in the passage dealing with the building of the temple of Solomon. They are supposed to represent the guardians of the house of God, and they symbolise His eternal presence. They are also supposed to be the guards of Paradise, and sometimes supposed to be the supernatural steeds upon which the Almighty sets out to deal with mortal affairs. In a poetic theophany (Is. xviii. 10) we see 'upon a cherub' parallel to 'upon the wings of the wind.' From this one might infer that they were sometimes looked upon as a kind of bird or possibly as a stormcloud, gathering with the winds. There have always been conflicting ideas as to what the C. are like, for according to the Revelation of St. John they had four faces. Other myths set out a bird-like form, while another version of them is a winged animal type. Probably this latter conception was derived from the drawings of the winged bulls and lions seen on the anc. Assyrian and Babylonian tombs and houses. If we study the scriptural description of these superhuman beings, we can but notice that the popular idea of a cherub being the winged bodiless head of a young child is utterly without foundation. The only similarity is that these heads are always depicted as coming out of clouds, but the faces never correspond with the old notion that they were spirits of the storm-cloud. At all events the C. are now used to adorn secular places even more than religious houses, for one often sees them in the ceilings of public halls. The meaning of the word is unknown, and may derive from a non-Semitic language.

Cherubini, **Maria Luigi Carlo Zenobio Salvatore** (1760-1842), b. at Florence, the son of a musician at the Pergola Theatre. He began to study composition at the age of nine under the Felici, and after their deaths under Bizzarri and Castrucci. In 1773 he composed a Mass, and by 1778 his growing success as a writer of church music led to his being sent to Venice to study under Sarti, who not only taught him well but gave him minor parts of his own scores to finish. From 1780 for fourteen years dramatic composition occupied C. In 1784 he visited London, and produced *La Finta Principessa* and *Julio Sabino*. In 1788 he produced *Figenia in Aulide* at Turin, but from 1788 Paris was his home, and he produced there *Démophon*, *Lodoiska*,

Elisa, Mtdée, Les Deux Journées, Ana-cron. In 1806 he produced *Faniska* at the Imperial Theatre, Vienna. In 1815 he composed an overture and a symphony for the Philharmonic Society, London. In 1816 he was made one of the superintendents of the royal chapel, and in 1822 had become director of the Conservatoire. In 1833 he produced his last work for the theatre, *Ali Baba*. Henceforward he devoted himself to church music, and his Requiem in D minor (1836) is one of his finest works. As a composer he is, with Gluck, the chief glory of the Fr. classical music, but as a teacher his influence was harmful in restricting his pupils by the narrow rules of an earlier age. Beethoven greatly admired him, and was influenced by his *Deux Journées* in his opera *Fidelio*, but C. neither understood nor appreciated Beethoven and his intolerance of fixed rules. He said of him, after meeting him in Vienna (1801), 'He was always brusque,' and of his music, 'It makes me sneeze.' Mendelssohn was the only young contemporary whom he openly praised.

Chéruef, Pierre Adolphe (1809-91), Fr. historian, b. at Rouen. He became prof. of hist. at Rouen College and then principal of the normal school in the same place in 1849. In 1866 he was made prof. of hist. at the Strasburg Academy, and in 1874 he occupied the same position in Poitiers. His prin. books are *Dictionnaire historique des institutions, mœurs, et coutumes de la France* (1849); *Histoire de France pendant la minorité de Louis XIV.* (1879-80). He also ed. *Lettres du Cardinal Mazarin pendant son ministère* (1870-91); the memoirs of Saint-Simon (1865); and the memoirs of Mlle de Montpensier (1891).

Cherusci, anct. Ger. tribe occupying the basin of the Weser, N. of the Harz Forest. They were under Rom. rule in 11-9 B.C., and are mentioned by Cæsar. In A.D. 9 Arminius, a prince of the C., revolted and destroyed the Rom. general Quintilius Varus and his army, and in vain Rome tried again to subdue them. Their prestige was wrested from them towards the end of the first century A.D. by their neighbours, the Chatti, and their ter. was later occupied by the Saxons. (Tacitus, *Annals*, i. 2, 11, 12, 13.)

Chervil, name of sev. species of umbelliferous plants, distributed throughout various genera. *Scandix* or *Anthriscus cerefolium* is a little-cultivated annual, a native of S. Europe, with slightly aromatic leaves which are used in soups and salads. *Anthriscus sylvestris* is a common weed found in woods. *Cherophyllum temulentum*, or *temulum*, the rough C., or cow-parsley, is a species occurring wild in the Brit. Isles, and *C. tuberosum*, the turnip-rooted C., is grown for its carrot-like roots which are eaten after the manner of carrots. *S. Pecten-Veneris*, the Venus's comb, or shepherd's needle, is a European plant which bears very large fruit, and their dehiscence is by a powerful jerk.

Cherville, Gaspard Georges Pesceur, Marquis de (1821-98); was b. at Chartres.

He was a collaborator of Dumas père, but he wrote independently a number of books on country life and sport. He also wrote *Au village, légendes et croquis rustiques* (1887), and *Les Chiens et les chats* (1888).

Cherwell, River, trib. of the Thames. It rises in the S.W. of Northamptonshire and flows S. for 30 m. through Oxfordshire, joining the main stream at Oxford.

Chesapeake Bay, in Maryland and Virginia, and dividing the former into two parts, is the largest inlet on the E. coast of the U.S.A., extending 200 m., with a width of from 4 to 40 m., from the mouth of the Susquehanna R. southward to Hampton Roads. Its entrance has on its N. side Cape Charles, and on the S., Cape Henry, 12 m. apart. The land on either side of the inlet is greatly indented, and receives the Rs. Susquehanna, Potomac, Rappahannock, and York on the W., and James on the S.W., all navigable rivs. The water is so deep that the largest ships can proceed almost to the mouth of the Susquehanna, and Baltimore is virtually washed by the ocean.

Cheselden, William (1688-1752), b. at Somerby in Leicestershire. He studied anatomy in London under Cowper (1666-1709), and in 1711 himself began to give lectures on the subject. He was elected a fellow of the Royal College of Science in 1712, and pub. a series of interesting papers, one of which recounted the sensations of a boy of fourteen on recovering his sight through the formation of an artificial pupil after being blind from infancy. In 1713 he pub. *Anatomy of the Human Body*, long the standard book on the subject. He was surgeon at the St. Thomas's, St. George's, and Westminster hospitals, and his skill as an operator has seldom been surpassed. The lateral operation for lithotomy as it is now practised was his invention. In 1737 he retired from practice owing to the jealousy of his colleagues, and d. of apoplexy at Bath, 1752. Alexander Pope was one of his intimate friends.

Chesham, mrkt. tn. in Buckinghamshire, England, 26 m. W.N.W. of London, is pleasantly situated in the valley of the R. Chess, and shut in by wooded hills. It manufs. straw-plait, shoes, wooden wares, and paper. The Chess is noted for its watercress and trout-fishing. Pop. of par. 10,500.

Cheshire, co. of England, bounded on the N. by the Irish Sea and the Mersey, and on its other sides by the shires of Lancaster, York, Derby, Stafford, Salop, Flint, Denbigh, and by the estuary of the Dee. Its greatest length from N. to S. is 48 m., breadth from E. to W. 32 m., total area (of land and water) 1027 sq. m., 76 per cent. of which is under cultivation. The surface of the co., except on the extreme E. and W. borders, is level, well-wooded, and studded with small lakes or meres. The plain rests on red sandstone, crossed by a ridge some 370 ft. high, running from N. to S. The chief rivs. are the Dee, Mersey, and Weaver, all navigable. In addition there is a splendid system of canals—C. contains the greater

part of the Manchester Ship Canal—and an excellent service of railways. The soil is chiefly clayey or sandy loam with marl and peat, and is very fertile. C. has the finest pasture land in England. The climate is moist and temperate. The land is divided into grazing and dairy dists., which provide the chief occupations. Cereals grow well here, especially oats, but the chief product of the co. is its cheese. Cotton and woollen goods, silk, and lace are manufactured at the tns. near the Lancashire and Yorkshire boundaries. One of the most remarkable products of C. is the rock salt found in mines in the Weaver valley, especially near Northwich, also saline springs from 20 to 40 ft. deep. There are numerous coal mines, and copper and lead are also found. Chester is the cap., and other big tns. are Birkenhead, Macclesfield, Stockport, Congleton, Crewe, Northwich, and Stalybridge. The co. is divided into eight parl. divs., each returning one member. C. contains numerous antiquities: Rom. roads, tumuli, barrows, remains of religious houses, and many old castles and manors. Egbert in 828 added C. to the A.-S. kingdom of Mercia. William the Conqueror made it a co. palatine under Hugh Lupus. Henry VIII. subordinated it to the Eng. crown, but the co. of C. did not send representatives to the Eng. Parliament until 1549. Pop. 1,090,000.

Cheshire Regiment (formerly 22nd Foot). Raised in 1689. Fought under Marshal Schomberg in Ireland and, in 1727, took part in the defence of Gibraltar, and the capture of the Is. of Louisbourg in 1758. Its grenadiers served under Wolfe at the capture of Quebec. Served many years in W. Indies, then participated in the Amer. war of Independence. Under Sir Charles Napier it gained great distinctions in the Scinde war of 1843. Bears honours for S. African war, 1899–1902. During First World War, raised thirty-eight battalions which served in France, Flanders, Gallipoli, Macedonia, Palestine, and Mesopotamia. Received title of C. R. in 1782. In the Second World War the regiment fought in N.W. Europe and Italy. Its badge is the well-known acorn issuing from oak-leaves.

Cheshunt, par. and vil. in Hertfordshire, England. It is situated on the R. Lea, 14 m. N. of London. In 1792 the countess of Huntingdon founded a college here, known as C. Theological College. Historically it is interesting, as Cardinal Wolsey stayed for a time at C. Great House, and Richard Cromwell d. at Pengelly House in 1712. Pop. 15,000.

Chesil Bank, or **Beach** (A.-S. *ceosil*, pebble-bank), curious shingle beach on the coast of Dorset, England. It runs 18 m. S.E. from Abbotsbury, and ends in the so-called isle of Portland. At Portland end the bank is 35 ft. above spring-tide level, and 200 yds. broad. A peculiar fact about it is that the pebbles decrease in size from 1 to 3 in. in diameter at Portland to the size of peas at the W. end.

Cheesme, or **Cesme**, small seaport in

Asiatic Turkey, 40 m. from Izmir (Smyrna) and opposite the Is. of Chios. The Turkish fleet was burned here in 1770 by the Russians under Orlov and the Eng. under Adm. Elphinstone and Sir Samuel Greig. The tn. suffered extensive damage from earthquake in 1881. Pop. 6000.

Chesné, **André du** (1584–1640), Fr. geographer and historiographer to Louis XIII. He was b. in the prov. of Touraine and became famous for his historical and philological learning, which won him the name of 'father of French history.' The work for which he is best known is his valuable collection of the oldest Fr. chroniclers, *Historiæ Francorum Scriptores cœtani, ab Gentis Origine usque ad Philippum IV. tempora*, of which he ed. four vols., and his son pub. the fifth after his father's death. He pub. many other historical works, among them a hist. of England.

Chesnelong, **Pierre Charles** (1820–99). Fr. politician. As leader of the Conservative opposition, he brought about the fall of Thiers in 1875. In the General Assembly in the following year, he waged decisive action in Italy in support of the Vatican against the National Monarchy. Promoted the estab. of Catholic univs. in France.

Chesney, **Charles Cornwallis** (1826–76), prof. of military strategy at Sandhurst, and a nephew of the explorer, Francis Rawdon C. He held the position of chairman of Sandhurst in 1861, during which time he acquired fame for his 'Waterloo Lectures' delivered there.

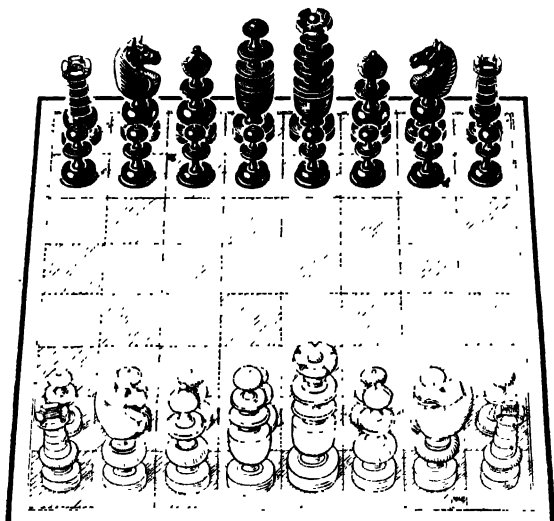
Chesney, **Francis Rawdon** (1789–1872). Eng. general and explorer, was b. in co. Antrim, Ireland. It was his report, drawn up in 1829, on the subject of the isthmus of Suez, that made de Lesseps project his canal scheme. The one great wish of his life was to have an overland route to India via the Euphrates, but the Fr. and Russian opposition was so great that the idea was abandoned. In connection with the scheme, however, he made three separate journeys to prove how far the Euphrates was navigable. He wrote the histories of his expeditions, one of which was *Narrative of the Euphrates Expedition* (1835–37).

Chesney, **Sir George Tomkyns** (1830–95), brother of Charles Cornwallis C. In 1848 he joined the Bengal Engineers, served in the Indian Mutiny, and in 1892 became a general, and entered Parliament as member for Oxford. He wrote sev. novels, *The Private Secretary* (1881), being the best known. He also wrote a highly imaginative description of a supposed invasion of England, entitled *The Battle of Dorking* (1871).

Chess, game played by two persons on a board composed of sixty-four squares, alternating black and white, so placed that a white square is on the right-hand extremity of the board before each player. Thirty-two chessmen are used, sixteen being black and sixteen white. One player takes the black men, the other takes the white, and each arranges his pieces on the board before him as shown in the illustration. Naming them from

the white square on the players right, the pieces in the back line are thus arranged: Queen's rook (the rook is known also as the castle), queen's knight, queen's bishop, queen, king, king's bishop, king's knight, king's rook. The front line is composed entirely of pawns. Considering the back line, it will be seen that each piece is directly opposite to an opposing piece of the same denomination; that queen faces queen and that king faces king. The white queen is on a white square and the black queen on a black square. The object of the game is to force the king of

for the beginner. The king has the power of moving one square from that which he is occupying, so long as the move does not expose him to capture by any of the enemy's pieces. Neither the king nor any other piece may move to a square which is already occupied by a piece of its own colour. Thus from his own square the king could move to Q square, Q 2, K 2, K B 2, and K B square, but no further by one move. The queen may move any distance in a straight line, either laterally or diagonally, but neither queen, rook, nor bishop may pass over an intervening



CHESSBOARD AND CHESSMEN

the adverse party into such a situation that he can neither move nor remain without the danger of being taken by some other piece; for the law of the game, as will be seen later, does not allow of his being actually captured, but only threatened, and he must then remove, if possible, out of danger. If he cannot, the game is lost. From the accompanying diagram, the names of the various squares on the board may be seen. That in front of the queen's rook is known as the queen's rook's second square. Two squares in front of the queen's rook is the queen's rook's third square. Similarly Q R 4 signifies the queen's rook's fourth square, etc. The pawns are known from the piece before which they stand. Thus, in front of the queen's rook is the queen's rook's pawn, in front of the king's knight is the king's knight's pawn, and similarly for the other pieces. It is necessary to consider now the ways in which the pieces move, as the complicated nature of these moves forms one of the main difficulties

piece. The rook also can move any distance, but his motion must always be lateral. The bishop, on the contrary, may move any distance diagonally, but may not move laterally. It will thus be noticed that the bishop always remains on squares of the same colour as his own. The white Q B can never be on a white square, and the white K B can never be on a black square. The knight's move is limited in distance and is composed of two short moves, a lateral move of one square followed by a diagonal move of one square. Thus, the Q Kt might move to Q R 3, Q B 3, or Q 2. The knight alone has the power of passing over another piece. The 'taking' of an opponent's piece is done by moving one of one's own pieces into the square occupied by one's opponent's piece and removing the latter. The pawn can only move in a forward direction (laterally) whereas all the other pieces may move either forward or backward. Its first move may be two squares or one, i.e. it may move to its

piece's third or fourth square, but after this first move it can only move forward one square at a time. Whereas it moves laterally, it can take diagonally alone. Thus, a pawn on Q 4 may take pieces on Q B 5 and K 5, but is stopped by a piece on Q 5. If a player succeeds in getting one of his pawns into a square occupied at the beginning of the game by one of his adversary's back line, he may exchange it for any piece except a king, either a queen, rook, bishop, or knight, so that he may possibly have two queens on the board at

each game, the privilege of *castling*, yet remains to be mentioned. The operation consists of a double move performed in conjunction with either the king's rook or the queen's rook, and counts as an ordinary move. In the first case K moves to K Kt sq., and K R moves to K B sq. In the second K moves to Q B sq., while Q R moves to Q sq. This move is only allowed if neither the king nor the rook has yet been moved, and it is further necessary that no piece should intervene between the two, that no square passed

♔5'8'0	♔5'8'K'0	♔5'8'0	♔5'0	♔5'K	♔5'8'K	♔5'8'K'K	♔5'8'K
Q.R.8	Q.Kt.8	Q.B.8	Q.8	K.8	K.B.8	K.Kt.8	K.R.8
♔7'8'0	♔7'8'K'0	♔7'8'0	♔7'0	♔7'K	♔7'8'K	♔7'8'K'K	♔7'8'K
Q.R.7	Q.Kt.7	Q.B.7	Q.7	K.7	K.B.7	K.Kt.7	K.R.7
♔6'8'0	♔6'8'K'0	♔6'8'0	♔6'0	♔6'K	♔6'8'K	♔6'8'K'K	♔6'8'K
Q.R.6	Q.Kt.6	Q.B.6	Q.6	K.6	K.B.6	K.Kt.6	K.R.6
♔5'8'0	♔5'8'K'0	♔5'8'0	♔5'0	♔5'K	♔5'8'K	♔5'8'K'K	♔5'8'K
Q.R.5	Q.Kt.5	Q.B.5	Q.5	K.5	K.B.5	K.Kt.5	K.R.5
♔4'8'0	♔4'8'K'0	♔4'8'0	♔4'0	♔4'K	♔4'8'K	♔4'8'K'K	♔4'8'K
Q.R.4	Q.Kt.4	Q.B.4	Q.4	K.4	K.B.4	K.Kt.4	K.R.4
♔3'8'0	♔3'8'K'0	♔3'8'0	♔3'0	♔3'K	♔3'8'K	♔3'8'K'K	♔3'8'K
Q.R.3	Q.Kt.3	Q.B.3	Q.3	K.3	K.B.3	K.Kt.3	K.R.3
♔2'8'0	♔2'8'K'0	♔2'8'0	♔2'0	♔2'K	♔2'8'K	♔2'8'K'K	♔2'8'K
Q.R.2	Q.Kt.2	Q.B.2	Q.2	K.2	K.B.2	K.Kt.2	K.R.2
♔1'8'0	♔1'8'K'0	♔1'8'0	♔1'0	♔1'K	♔1'8'K	♔1'8'K'K	♔1'8'K
Q.R.1	Q.Kt.1	Q.B.1	Q.1	K.1	K.B.1	K.Kt.1	K.R.1

NUMERICAL POSITIONS OF A CHESS-BOARD

once. A king, as has been said, cannot be taken. When another piece attacks him and he is in such a position that he might be taken at his adversary's next move, he is said to be *in check*, and a player putting his adversary's king in such a position says 'Check' on doing so. A player whose king is in check must do one of three things at his next move. He must move out of check, or interpose another piece so as to shield the king, or take the checking piece. When he can do none of these things he is said to be *checkmated*, 'Checkmate' is called, and the game is over. Should a player be in such a position that he can move none of his pieces without putting his king in check, but yet his king is not in check at the moment, the game is drawn, the result being given as a *stalemate*. A drawn game also results through neither player being able to checkmate the other. An important privilege allowed to the king, once in

over should be commanded by one of the enemy's pieces, and that the king should not be in check. Note must also be made of a particular method of taking by the pawn known as taking *en passant*. It may occur when a white pawn is on a fifth square, say K B 5. If, then, the black K Kt pawn makes its initial move of two squares (i.e. to K Kt 4 or K 4), it may be taken *en passant* by the white pawn on K B 5, the white pawn moving to K Kt 3 or K 3 as the case may be. A *sacrifice* is a method often used to secure an opening for attack. If a pawn or piece, usually a pawn, is sacrificed in order to enable a piece to secure a better position. There are various gambits, such as king's gambit, queen's gambit, etc., to each of which there is a recognised defence. The various methods of opening a game of C. may soon be learnt. White generally makes the first move, and so it is usual for the players to draw for colours. The

commonest first move is that of the king's pawn to K 4. The commonest second move is that of K Kt to K B 3, and these two form an excellent opening for beginners. Sometimes the stronger player gives odds to the weaker player to make the game more even. It may consist of the removal of any piece from the stronger player's ranks according to the odds to be given. If a pawn be given, it is almost invariably the king's bishop's pawn. It is not necessary to go into further detail as to the method of playing C., as there are many valuable handbooks to which reference may be made. On account of the interest derived from the infinite variety of its combinations, and from success depending entirely upon skill wholly independent of chance, it has become a favourite game among the educated persons of all nations, and in the course of centuries a vast literature has gathered round it.

History.—The game is of the greatest antiquity, and much dispute has arisen as to the country whence it first took its rise. The game was not known to the ancients, Greeks or Romans. A distinct balance of historical tradition inclines to Hindustan. Here it has been known immemorially under the name of *chaturanga* (from *chatur*, four, and *anga*, a part or member), that is, the four *angas*, or members of an army, which are said in the *Amara-kosha* to be elephants, horses, chariots, and foot soldiers. As applicable to real armies, the term *chaturanga* is often used by the epic poets of India. In a Sanskrit MS., *Bhavishya Purana*, is given a description of a four-handed game of C. played with dice, and some historians consider this to be the most ancient form of the game. But it is not shown precisely how the four armies commanded by four kings in the above MS. became converted into two opposing armies (see on this Van der Linde, *Geschichte und Literatur des Schachspiels* (Berlin, 1874). From India* the game passed into Persia and became known there by the name of *shatranj*. The game passed from the Persians to the Arabians after they took possession of Persia in the seventh century, and from them, directly or indirectly, it is conjectured that it came to Spain and other parts of Europe, perhaps about the eleventh century. It was known to the cultured classes throughout Europe by the time of the Crusades. The original method of play differed widely from the present one, the development of the game continuing until the sixteenth century, when castling, the latest addition, was introduced. The first book printed in England was *The Game and Playe of the Chesse*, issued by Wm. Caxton in 1475, and this fact shows the popularity of the game. The most masterly treatises on C. begin in the sixteenth century with the Portuguese Damiano, whose work is, however, distinctly inferior to the treatise by Ruy Lopez, a Sp. cleric, pub. at Alcalá in 1561. By the end of this century, the chief home of the game had shifted to Italy, where the city of Venice had the pre-eminence. Among the chess-

masters of this period may be named Salvio, Greco, and Polerio. The seventeenth century is comparatively unimportant, but the eighteenth century saw a great revival in the study of C. In the N. of Europe the name of Philidor stands alone, and in the S. the names of Ercole del Rio, Lolli, and Ponziani deserve mention. In the nineteenth century England became the supreme chess-country, and Howard Staunton was generally recognised as the world's greatest player. A greater genius, however, Paul Morphy (1837–1884) by name, arose in America, and defeated the strongest players of Europe. He never actually encountered Staunton, who evaded his challenges, but after Morphy had retired from the game, Staunton was defeated by Anderssen, who was in turn succeeded as champion by Steinitz. Anderssen belonged to the older school, advocating combinative methods, and Steinitz, who has had great influence on modern theory, believed in positional methods. In 1894 he was defeated by the third Ger. champion, Emanuel Lasker, who held the title for twenty-seven years. A long projected match between him and Capablanca, the Cuban chess genius, eventually took place in 1920, and Lasker resigned after losing four games and drawing ten. Since that date C. has been dominated by the personalities of Capablanca (b. 1888) (*q.v.*) and the Russian, Alekhine (b. 1892) (*q.v.*). In 1927 Alekhine challenged Capablanca to defend his title, and after a match of thirty-four games Alekhine won six, Capablanca three and twenty-five were drawn. In 1934 Alekhine defeated Bogoljubow, winning eight, losing three, and drawing fifteen. Max Euwe became champion in 1935, beating Alekhine, 15½–14½ points, but in 1937 Alekhine beat Euwe 17½–12½ points. Lasker, however, excelled in tournament play and defeated both Alekhine and Capablanca at a tournament in New York. It is ruled that the title goes to the player who wins the greatest number of games, provided that the number won is not less than six. During his championship Capablanca proposed enlarging the board and adding two new pieces, the 'Chancellor' and the 'Marshal', with the idea of avoiding drawn games, so recurrent in championship matches, but his proposals have not been adopted. International C. is governed by the Fédération Internationale des Échecs, which held its first tournament at Budapest in 1926. Ann. Eng. championships are held by the Brit. Chess Federation, founded 1904.

See J. R. Capablanca, *Chess Fundamentals*, 1922; A. Alekhine, *My Hundred Best Games of Chess*, 1927; *Practical Chess Players' Hand Book*, 1928; M. Euwe, *Strategy and Tactics in Chess*, 1937; G. Abrahams, *Teach Yourself Chess*, 1948.

Chest, or **Thorax**, anatomical term for the uppermost section of the trunk, or that part of the body which is above the abdomen and below the neck. It contains the heart and lungs, the great arteries and veins, the windpipe and its

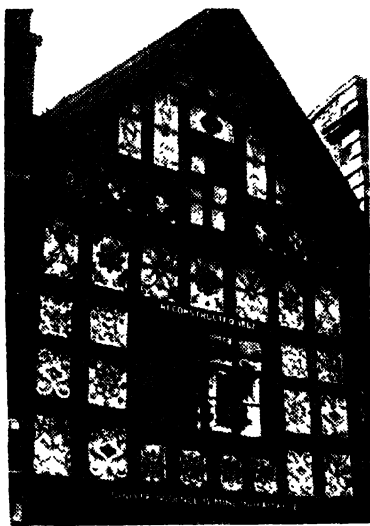
branches, the gullet and the thoracic duct, and is conical in shape, with rounded sides which are flattened at front and back. (For the organs of the chest, see the diagram accompanying article on ABDOMEN.) The upper end is small, slopes downwards and forwards, and contains the gullet and windpipe, and those arteries and veins leading from and to the heart through the neck, together with certain nerves. The lower end is larger, slopes downwards and backwards, and is enclosed by the diaphragm, which is convex when viewed from above, and which separates the C. from the abdomen. Muscles radiate from this diaphragm to the body wall, and in respiration, by the contraction of these muscles and the consequent flattening of the diaphragm, together with the action of the layer of muscles covering the C., which draw the ribs upwards and outwards, the cavity of the C. is enlarged. The C. is constructed of twelve pairs of ribs starting from the vertebral or spinal column, together with the breastbone, the diaphragm, and the intercostal muscles. Since the C. contains the heart and lungs, two of the three vital organs of the body, the other being the brain, it is the seat of a large number of the diseases of the human system. The common diseases of the C., such as pneumonia, pleurisy, consumption, etc., are really diseases of the lungs and air tubes. Tight lacing and rickets, which cause alterations in the form of the C., often cause C. diseases. See HEART, MAN, SKELETON, ANATOMY, PHYSIOLOGY, etc.

Chest, large box made of wood or iron with a hinged lid, used as a receptacle for treasure, records, or linen, etc. It is of very ant. origin, being one of the oldest pieces of household furniture. In the old days Cs. were sometimes covered with leather and often very much ornamented. They were frequently transferred from place to place as personal luggage. Cs. are now often found in churches for the reception of vestments, plate, and par. records, etc., equivalent to being modern safes or strong-boxes. *Coffer* (O.F. *cofre*; Low Lat. *cofrum*) is a C. or box for money or valuables, and the word was used as a synonym for treasury (cf. 'Comes to the privy coffer of the State,' *Merchant of Venice*).

Chester, episcopal city, parl. and co. bor. and the administrative and geographical cap. of the co. of Cheshire, England, on the r. b. of the Dee, 16 m. S.E. of Liverpool. It is an important shopping and residential centre to which has been added the development of progressive specialised light industries such as the manuf. of electrical switch-gear and metal window frames, aided by the fact that it is an important road and rail centre.

It is almost 2,000 years ago since the 20th Rom. Legion chose as the site for its fortress a low sandstone hill at the head of the estuary of the R. Dee and called it after the riv.—*Deva*; this was the beginning of C. In late Saxon times, it was a place of consequence with its

own mint and royal palace, and not until six years after the battle of Hastings did it submit to Norman rule. The early Middle Ages were perhaps the time of C.'s greatest glory; its port had by then become the centre for the trade with Ireland, and the city itself was the base for many a warlike royal expedition into Wales. In 1237, on the death of the last of the Norman earls, the earldom was taken into the hands of the Crown and has since always been one of the titles of the eldest son of the king—Prince of Wales and earl of Chester. King Richard II. held the city in especial esteem,



John H. Stone

GOD'S PROVIDENCE HOUSE, CHESTER

elevating the earldom to the dignity of a principality. By the fifteenth century the silting up of the R. Dee had begun to interfere with traffic to the harbour and in time it gradually strangled the seaborne trade of C. The city has possessed sheriffs since the time of the Norman earls and mayors since 1238. Its constitution was confirmed by the great charter of Henry VII. in 1506, the city being constituted a co. of itself. The mayor is by virtue of his office admiral of the Dee (a relic of C.'s former maritime greatness).

C.'s most distinctive architectural feature is its rows. These consist of a double tier of shops, one at ground level and the other at first-floor level, each provided with a footway, the upper one being set back and covered by the second storeys of the buildings. The first historical reference to the rows occur in the early fourteenth century. C.

is the only city in England which still possesses its walls perfect in their entire circuit of two miles. Built originally by the Romans in the first century A.D., and later extended, they still contain substantial portions of Roman work. The old gateways have been rebuilt but some of the towers still remain. There are many picturesque timber-framed houses, notably Bishop Lloyd's House (early seventeenth century), God's Providence House (built 1652 and reconstructed 1862), Leche House (sixteenth century), Stanley Palace (1591) in Watergate Street, the 'Bear and Billet' (seventeenth century), Tudor House (seventeenth century), and the Falcon Café (1626) in Lower Bridge Street.

The cathedral, which up to the time of Henry VIII. was a Benedictine abbey, dates from 1053. Built in a combination of every style from Norman to Late Perpendicular, it was restored in 1876. In a comparatively modern set of corbels on the walls of its S. transept are included the old story of Alexander and the griffins, besides caricatures of Disraeli, represented as the Brit. lion defending the Crown against Dr. Kenealy, and Gladstone with daggers and lion's body, in the act of overthrowing the Irish Church. Also noteworthy are the churches of St. John the Baptist (traditionally said to have been founded by King Ethelred in A.D. 689 and perhaps more probably by Earl Ethelred in 901); St. Mary-on-the-Hill (belonging mainly to the fifteenth and sixteenth centuries); and St. Peter (a church has occupied this site since A.D. 907). The chief modern buildings are the tn. hall (1869); Grosvenor Museum and School of Art, built at the suggestion of Charles Kingsley, who was then canon of C., and the King's School, founded by Henry VIII. (1541) and reorganised as a public school in 1873. Roodee Common (69 ac.) is the scene of the ann. race meeting in May. *The city returns one member to Parliament. Pop. 47,500.

Chester, city in Delaware co., Pennsylvania, U.S.A., and 15 m. from Philadelphia. The Pennsylvania Military College and the Crozier Theological Seminary are both estab. here. It has large shipyards, boiler and engine works, factories and foundries, etc. Pop. 59,000.

Chester, Earl of, see BLUNDELL, RANDOLPH DE.

Chesterfield, mrkt. tn. and municipal bor. in Derbyshire, 24 m. N.N.E. of Derby, on the R. Rother, and a canal connecting it with the Trent. It has manufs. of cottons, silk, lace, hosiery, earthenware, and machinery. In the neighbourhood are iron, coal, and lead mines. Pop. 64,000.

Chesterfield House. Mayfair mansion at the junction of S. Audley and Curzon Streets, London, W. It was built in 1750 by Isaac Ware for the fourth earl of Chesterfield, and, after the latter's death, was held by the Chesterfield family until 1850. Purchased in 1919 by Viscount Lascelles (later earl of Harewood) who left it in 1931.

Chesterfield (Earls), title borne by the

family of Stanhope, later Scudamore-Stanhope. In 1883 the direct line failed, and Henry E. Scudamore-Stanhope became the ninth earl. The earl's eldest son is styled Viscount Porchester.

Chesterfield, Philip Dormer Stanhope, fourth Earl of (1694-1773), statesman, courtier, and letter-writer, eldest son of the third earl. Went to Trinity College, Cambridge. In his youth was in the household of the Prince of Wales (afterwards George II.). He succeeded to the earldom in 1726, and two years later went as ambas. to The Hague, where he remained until 1732. He had formed an intimacy with Mlle du Bouchet, by whom he had a son, but the connection did not endure, and in 1733 he married the daughter of the duchess of Kendal. Soon after he became the recognised leader of the opposition in the House of Lords, and subsequently held important ministerial and diplomatic appointments. Nowadays, however, he bulks more largely on the public mind because of his connection with letters. He was a friend and correspondent of Voltaire, and at one time offered to befriend Johnson, who in 1747 addressed to him the 'plan' of his dictionary. C. thought no more of Johnson until the pub. of that work was announced seven years later, when he wrote in the *World* about it, a belated attention which the lexicographer resented. 'The notice which you have been pleased to take of my labours, had it been early, had been kind; but it has been delayed until I am indifferent and cannot enjoy it; till I am solitary, and cannot impart it; till I am known, and do not want it.' So Johnson wrote to him, and the letter has been universally acknowledged as a masterpiece of indignant rebuke. C.'s fame rests mainly upon the letters to his natural son, in which he, the most elegant of mankind, endeavoured to teach his son the art of being agreeable in society. He preached the graces rather than the morals, and it was the cross of his life that the recipient of his worldly sermons was in no way improved by them. These letters were pub. by his son's widow, Eugenia Stanhope, in 1774, and were included in Lord Mahon's *Letters of Philip Dormer Stanhope, Earl of Chesterfield* (1845-53). See W. Ernst, *Memoirs of the Life of Philip Dormer, fourth Earl of Chesterfield*, 1893; S. Shellabarger, *Lord Chesterfield*, 1935.

Chester-le-Street, mrkt. tn. in the co. of Durham, 6 m. N. of Durham city. Its par. church of St. Mary and St. Cuthbert was formerly collegiate, and the vil., situated on the anct. Kilmine Street, was the seat of the bishop of Bernicia from 883 to 995, under the name of Cunceastre. In its neighbourhood are Lambton, Lumley, and Ravensworth Castles. Collieries and iron works are numerous. Pop. 17,000.

Chester Plays, see under MIRACLE PLAY, MORALITY.

Chesterton: 1. Par. and vil. in Cambridgeshire on the N. bank of the R. Cam, 1 m. from Cambridge, and forming

a suburb. Pop. 12,000. 2. Par. and vil. in Staffordshire, 2 m. from Newcastle-under-Lyme, noted chiefly for its extensive colliery and iron works. Pop. 10,000.

Chesterton, Cecil Edward (1879-1918), Eng. journalist and author, *b.* in London, Nov. 12, brother of G. K. Chesterton (*q.v.*). Educated at St. Paul's School. His first book, *Gladstonian Ghosts* (1905), was directed against traditional liberalism. In 1910 appeared *Party and the People* and *Nell Gwynne* in 1911; and in the latter year, in collaboration with Hilaire Belloc (*q.v.*), he wrote *The Party System*. On executive of Fabian Society, 1905-7; first secretary of Anti-Puritan League, 1907. Sub-editor of *Eye Witness* (afterwards *New Witness*), 1911-1912; then editor. Became a Rom. Catholic 1912. His persistent criticism of the circumstances connected with a contract between the gov. and the Marconi Wireless Telegraph Company led to the House of Commons appointing a committee of inquiry, and he was fined for criminal libel. In the war period, before he joined the colours, he pub. *The Prussian hath said in his Heart*—(1914) and *The Perils of Peace* (1916). He d. in a military hospital in Boulogne.

Chesterton, Gilbert Keith (1874-1936), Eng. journalist and author, *b.* at Campden Hill, Kensington, May 29, educated at St. Paul's School until 1891, and then entered the Slade School to study art. He soon began literary work, however, at first reviewing art books for the *Bookman* and the *Speaker*, and working in a publisher's office. He definitely took up literature as a career in 1900, and contributed largely to the *Daily News*, the *Pall Mall Magazine*, *Black and White*, *Daily Herald*, the *World*, the *Clarion*, the *English Illustrated Magazine*, the *Bystander*, the *Fortnightly* and the *Independent* reviews, and the *Illustrated London News*. It was his *Browning* in the Eng. Men of Letters series that first gave him a place among the critics. With *The Napoleon of Notting Hill* (1904) he began the fantastic romances which, together with the 'Father Brown' detective stories, captured the larger public. A Saturday column in the *Daily News* stung the party liberals through a decade. For thirty years he wrote the Notebook page of the *Illustrated London News*—an astonishing feat for the most anarchic of journalists. Prose and verse flowed unceasingly from his pen. In 1901 he married Frances Blogg. He is popularly regarded as merely a fountain of brilliant paradox, but that is a very superficial reading of him. Largely influenced by his friend Hilaire Belloc, he gradually discarded, or became aware of his innate mistrust of, all ideas of evolutionary development—which appeared to him to involve a mechanistic conception of mankind. The student of his analyses of social nuisances will be struck by his way of finding the whole source of the mischief in the wickedness of somebody's heart, and by his seeming inability to go farther than deliver an

eloquent and indignant pronouncement of blame upon some person or persons. This line of thought could have but one issue—C.'s reception into the Church of Rome was announced in Aug. 1922.

Being, like all good Catholics, rigidly logical, C. applied the same principle in his positive politics. Regarding the conscious will as the cause of all action, he saw no reason why a past state of affairs should not be resuscitated anywhere if desirable. So he was president of the Distributist League, of which *G.K.'s Weekly* was (more or less) the organ. Distributism (*q.v.*) is a term invented by Belloc (*q.v.*) to connote a revolt against Capitalism in the direction opposite to Socialism. It was C.'s view that it would strengthen the 'small man,' discourage 'big business,' and endeavour to re-localise the population.

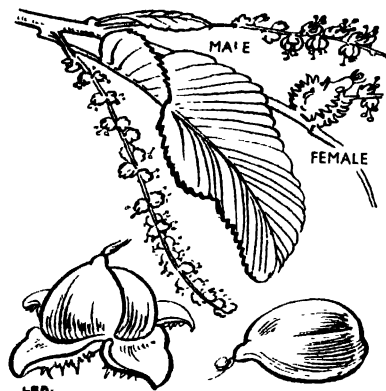
Among his books are *The Wild Knight and other Poems* (1900), *The Defendant* (1902), *Twelve Types* (1902), *G. F. Watts* (1904), *The Club of Queer Trades* (1905), *Dickens* (1906), *Orthodoxy* (1908), *George Bernard Shaw* (1909), *The Innocence of Father Brown* (1911), *The Victorian Age in English Literature* (1913), *The Flying Inn* (1914), *The Wisdom of Father Brown* (1914), *Poems* (1915), *A Short History of England* (1917), *Irish Impressions* (1918), *The Uses of Diversity* (1921), *Eugenics and other Evils* (1922), *What I saw in America* (1922), *St. Francis of Assisi* (1923), *William Cobbett* (1925), *The Return of Don Quixote* (1927), *Generally Speaking* (1928), *Catholic Essays* (1929), *Chaucer* (1932), *The Scandal of Father Brown* (1935), *Autobiography* (1936) *The Paradoxes of Mr. Pond* (1937).

See E. Cammaerts, *The Laughing Prophet*, 1937; Maisie Ward, *G. K. Chesterton*, 1944; H. Kenner, *Paradox in Chesterton*, 1948.

Chesters, residence near Chollerford, Northumberland, England. It is in the midst of a part containing a section of the Rom. wall and remains of the Rom. station of Cilurnum. Much excavation work has been carried out and a fine collection of Rom. remains is housed in the museum in the park.

Chestnut, or **Castanea**, genus of Fagaceae known to the N. hemisphere and cultivated for the handsome appearance of the species and the economic value of the fruit. *C. sativa*, or *vulgaris*, the Sp. or European C., helps to form dense forests, and the fruit consists of two or three nuts enclosed in a prickly burr; the bark is used in tanning, and the wood is made into furniture and palings. The fruit, called the sweet C., forms a common article of diet in Europe in its raw state, when roasted, or when ground into flour. As confectionery they are candied, and receive the name of *marrons glacés*; the starchy matter contained in them makes them of great value as a food. The horse C., or *Esculus Hippocastanum*, differs in most important botanical points from the sweet C.; it is a species of *Illicacastanaceae* which is cultivated for its stately appearance, and the fruit is a loathly capsule resembling the sweet C. only in

being prickly. The specific name was given to the plant on account of the marks of the leaf-scar which seem like a miniature horse-shoe. The Australian *C.*, or *Castanospermum australe*, is a leguminous plant which is the only species in the genus; its outward appearance is unlike *Castanea*, but the roasted seeds taste like those of the sweet *C.*



CHESTNUT

Chetham, Humphrey (1580-1653), *b.* at Crumpsall Hall, Manchester. He was in turn a merchant, a private banker, and a cloth manufacturer in Manchester. He amassed a considerable amount of money, £7,000 of which he left for the foundation of a hospital for forty poor boys. This was opened in 1656, and the number of boys now cared for has greatly increased. With a further £1000 and the residue of his property he founded a library, now containing over 100,000 vols.

Chettie, Henry (c. 1560-c. 1607), dramatist and pamphleteer, son of Robert C., a dyer of London. In 1577 he bound himself as apprentice to a stationer. In 1592 he pub. *Green's Groat's-worth of Wit*. He found it necessary to repudiate any share in the pamphlet in his *Kind hart's dream* (1593), and to apologise to three persons who were abused in it, of whom Shakespeare is supposed to be one. In 1595 he pub. *Piers Plainnes seaven yerres prentiship*, and between then and 1603 he wrote, or collaborated in, over forty plays. Meres speaks of C. in his *Palladis Tamia* as 'one of the best for Comedy.' His pecuniary difficulties were constant, and are sev. times referred to by Henslowe in his *Diary*. Of C.'s own plays only *The Tragedy of Hoffman* was printed (1631). For *Troyes Revenge* and the tragedy of *Palaeeme* Henslowe paid him 'fifty shillings.' In *The Pleasant Comedie of Patient Griswilt* (1603) he collaborated with Dekker and Haughton, and in *The Death of Robert, Earle of Huntingdon* (1601), with Munday. In 1603 he pub. *England's mourning garment*,

an elegy of Queen Elizabeth, in which he alludes to contemporary poets. See H. Jenkins, *The Life and Work of Henry Chettle*, 1934.

Chetwode, Sir Philip Walhouse, first Baron (b. 1869). Brit. soldier. Educated at Eton. Entered 19th Hussars (from militia), in 1889. Colonel 1911, major-general 1916, lieutenant-general 1919, general 1926. Fought in the Burma campaign 1892-93, and in the S. African war 1899-1902. In the First World War he commanded the 5th Cavalry Brigade in 1914-15, the 2nd Cavalry Div. in 1915-16, the desert column and canal defences, Egypt, 1916-17, and finally the 20th Army Corps 1917-18, which captured Jerusalem. Mentioned in dispatches eleven times. After the First World War he was military secretary to the secretary of state for war 1919-20, deputy chief of the Imperial General Staff 1920-22, adjutant-general to the forces 1922-23, general officer commanding-in-chief Aldershot Command 1923-27, chief of the General Staff, India, 1928, commander-in-chief in India 1930-35, field marshal 1933, constable of the royal palace and the fortress of London 1933.

Chetwood, Knightly (1650-1720), Eng. divine and writer, *b.* at Coventry, became dean of Gloucester about 1707. He contributed a life of Lycurgus to the trans. of Plutarch's *Lives* pub. in 1683, and wrote the life of Virgil and the preface to the *Pastorals* in Dryden's trans. of Virgil (1697), and sev. biographies, essays, trans., sermons, and poems.

Chetwood, William Rufus (d. 1766), an Eng. dramatist and critic. He was for many years a bookseller in Covent Garden, and later became a prompter at Drury Lane Theatre. His works include *The Stock Jobbers and South Sea* (1720); *The Lovers' Opera* (1729); *The Generous Freeman* (1731); and *A General History of the Stage* (1749).

Cheval de Frise, or Chevaux de Frise (Fr. *cheval*, a horse; *de Frise*, of Friesland), in fortification, an obstacle consisting of pieces of timber traversed with iron spikes, five or six feet long and pointing outwards, used to close a breach or defend a narrow passage against the advance of cavalry. It was first used in the Dutch war of Independence at the siege of Grouningen in anct. Friesland.

Chevalier, formerly a horseman, or a knight; it is also an honorary title used by the younger sons of a Fr. noble family. The name is still in use among members of certain foreign orders, such as Chevalier of the Legion of Honour. Prince Charles Edward was known as the 'Young Chevalier.'

Chevalier, Albert (1861-1923), Eng. coater comedian and music-hall artist, *b.* in London, the son of a Fr. master at Kensington Grammar School. In 1877 he acted in *An Unequal Match* at the Prince of Wales's Theatre, taking the name of Knight, and later he was associated with John Hare. In 1891 he introduced his famous coater comedian sketches and songs at the Pavilion Music

Hall. He wrote many plays, sketches, and monologues; and one of the former, *Tommy Dodd*, was produced in 1898 at the Globe Theatre. In his later years he frequently gave entertainments consisting of items from his former 'turns.' His last public appearance was in Nov. 1922, in *My Old Dutch*, by himself and Arthur Shirley. He d. at his house at Woodberry Down, near Stoke Newington, July 10.

Chevalier, Michel (1806-79), eminent Fr. economist and statesman, b. at Limoges. In his early days he trained as an engineer, but in 1829 he joined the Socialist school of Saint-Simon. He became the editor of the *Globe*, the organ of the Saint-Simonians, and in 1832 he was arrested, and sentenced to a year's imprisonment on account of certain articles which had been pub. He was released after six months, and sent by Thiers to America to inquire into the railway and water systems there. Later he went on an economic expedition to England, which resulted in the pub. of his *Des intérêts matériels de la France* (1838). In 1840 he was made prof. of political economy at the Collège de France. In 1851 he pub. an important book advocating free trade; and he, with Richard Cobden, played an important part in securing the commercial treaty between France and England, 1860. The same year he was created member of the Senate, and for many years took an active part in discussions, until he retired from public life in 1870.

Chevalier de St. George, see STUART, JAMES FRANCIS EDWARD.

Cheviot Hills, range of hills stretching from N.E. to S.W. between England and Scotland, and covering about 35 m. of the border between the two countries. The larger part of the range is in England, the smaller portion being in Roxburghshire. The highest peak is Cheviot, 2676 ft. The other peaks forming the range are Cairn Hill, 2545 ft., Hedgehope Hill, 2348 ft., Windygate Hill, 2001 ft., Peel Fell, 1964 ft., and Carter Fell, 1815 ft. The range is well covered with grass, and affords excellent pasturage for the flocks which graze on its sides. The S.W. portion of the range consists chiefly of limestone belonging to the carboniferous system, but the highest peaks are of volcanic origin, pointing to the Lower Old Red Sandstone Age. A huge mass of granite pierces these volcanic-formed rocks for about 20 sq. m., forming the highest peak, Cheviot.

Chevreul, Michel Eugène (1786-1889), Fr. chemist, b. at Angers, where his father was a physician. At the age of seventeen he went to Paris, and entered L. N. Vauquelin's college, where he studied with much zeal and success, becoming in time Vauquelin's assistant at the natural hist. museum in the Jardin des Plantes. In 1813 he was made prof. of chem. at the Lycée Charlemagne, and took charge of the Gobelins tapestry works, where he performed his researches on colour contrasts. In 1826 he became a member of the Academy of Sciences, and was elected foreign member of the

Royal Society of London. In 1830 he became director of the natural hist. museum in Paris. In 1886 his hundredth birthday was celebrated with great public rejoicings, and a grand fête given at the museum in his honour. His name is famous for his discoveries of margarine, stearin, and olein, as well as for research work on dyes and soap-making.

Chevron (Fr. *chèvre*, a goat), in architecture a decoration introduced into England in the eleventh century, and consisting of a moulding with a zigzag outline, examples of which are to be found in Canterbury Cathedral and some parts of Durham Cathedral. It is a common decoration in the Zimbabwe ruins, Rhodesia, and in S. Arabia. It is used also on shafts, as in the cloisters of Monreale, near Palermo, in those of St. Paul, outside Rome, and in many Ger. churches. Its first appearance was on the tomb of Agamemnon, at Mycenæ. In heraldry C. is one of the ordinaries formed of two bands, joined together at the top, and coming down to the ends of the shield in the form of a pair of compasses. Shields may have one, two, or three Cs., and in some as many as five have been found. It is probably the earliest among the Eng. armorial charges. As badge of rank, see STRIPES AND CHEVRONS.

Chevrotain, or Mousse-deer, of the mammalian ungulate family Tragulidæ. The family includes two genera, *Tragulus* and *Doreatherium*. The first contains many species of small animals, which have more or less the characteristics and habits of some rodents. They inhabit Asia, the Malay Archipelago, Ceylon, and India. To the second belongs only one species, known as the water C., which comes from Africa.

Chevy Chase, name of a well-known Eng. border ballad. The incidents in the ballad are not founded on historical fact, though it may refer in part to some encounter which took place between its heroes, Percy and Douglas.

Chewing-gum, preparation made from a gum called chicle, which is the production of a Mexican tree of the same species as the india-rubber tree. It is sweetened, and various flavouring substances are added to it. It has become in the U.S.A., a very favourite sweetmeat, which is chewed but not swallowed.

Cheyenne: 1. The cap. tn. of the state of Wyoming, U.S.A., situated near the Laramie Mts. It is a centre of the cattle industry, and coal and iron are found in the vicinity. Here is the State Capitol, the Federal building, and the governor's mansion. Pop. 22,000. 2. A riv. in U.S.A., composed of two branches, which take their rise in Wyoming, and flow N.W. through S. Dakota to join the Missouri, 35 m. N.W. of Pierre. Length of each branch about 350 m.

Cheyennes, N. Amer. Indians, part of the Algonquin family, and separating in the seventeenth century from the Arapahoes, forced a way through many fierce Siouan tribes, and after crossing the R. Missouri, reached the Black Hills of

S. Dakota, from where they passed into Wyoming and Colorado. In 1850 they were numerous in the tracts of land between the Platte and Upper Arkansas Rs., but now they inhabit only the dists. round Montana and Oklahoma.

Cheylesmore, Herbert Francis Eaton, third Baron (1848-1925), Eng. soldier. Entered Grenadier Guards 1867, and reached the rank of major-general. On retirement from the army in 1899, he devoted himself to municipal work, being mayor of Westminster 1905-8 and chairman of the London Co. Council, 1912-13. A skilled marksman, C. was the leading spirit in the foundation of the Bisley ann. meeting. During the First World War he presided over sev. courts martial, including that which condemned to death Karl Loder, the Ger. spy.

Cheyne, George (1671-1743), celebrated Scottish physician who was b. in Aberdeenshire. He first thought of entering the Church, but finally abandoned the scheme and studied medicine under the famous Dr. Pitcairn. He took his M.D. degree in 1700, and practised in London in the winter months and at Bath during the summer. He grew enormously stout, and lived on milk and vegetable diet so as to reduce his size. Pub. many medical treatises.

Cheyne, Thomas Kelly (1841-1915), Eng. theologian and O.T. scholar, b. in London. He was educated at Merchant Taylors' School, and afterwards went to Worcester College, Oxford. Later he went to Gottingen, and studied the Ger. theological methods. At Oxford he won the chancellor's medal for the Eng. essay, and in 1869 became fellow of Balliol College. He was appointed rector of Tendring in Essex in 1881, where he remained until 1885, when he was made prof. of the interpretation of Holy Scripture at Oriel College, Oxford, which post also held a canonry at Rochester. In 1889 he delivered the Bampton lectures at Oxford. He was a member of the O.T. revision company, and joint editor of the *Encyclopaedia Biblica*, 1899-1903. He was also in earlier years editor of the O.T. portion of the Variorum Bible, and organised the theological part of the original *Academy*. In 1908 he resigned his post as prof. He was author of many books and lectures, the most important of which are *The Prophecies of Isaiah* (1880-81); *Exposition of Jeremiah and Lamentations* (1883); *Book of Psalms* (1884, 1888); *Job and Solomon* (1887); *Jeremiah, his Life and Times* (1888); *The Hallowing of Criticism* (1888); *Aids to the Devout Study of Criticism* (1892); *Introduction to Isaiah* (1895); *Isaiah* (1897-99); *Jewish Religious Life in Post-Exilic Times* (1898); and *Critica Biblica* (1903).

Cheyne, Sir William Watson (1852-1932), Scottish surgeon and author. He was associated at King's College Hospital in London with Joseph Lister, afterwards Lord Lister, his former teacher at Edinburgh. He went out as consulting surgeon in the S. African war. He was the author of a great number of books on antiseptic surgery; arranged, with Burgard, a *Manual of Surgical Treatment*

(1899-1903), and wrote *Lister and his Achievement* (1925).

Cheyne-Stokes Respiration, breaking up of the ordinary rhythm of breathing into periods of waxing and waning, occurring in affections of the central nervous systems. The breathing increases in depth until it reaches a maximum, becomes shallower again until it ceases altogether, then recommences and gains in depth once more, the cycle being repeated again and again. The cause of the condition is the insensibility of the respiratory centre in the medulla due to meningitis, general paralysis, intoxications, etc. The respiratory centre is only stimulated sufficiently when the blood has become venous; after deep breathing the venous condition is mitigated, so that the breathing becomes shallower and eventually stops until the consequent venosity of the blood starts the cycle afresh. The symptom is obviously dangerous, as exhaustion of the respiratory centre proceeds until no stimulation is possible.

Chhatapur, cap. tn. in C. State, Central India, situated 120 m. S.W. of Cawnpore. The manuf. of cutlery forms the chief industry.

Chhattisgarh, name of one of the dists. in the Central Provs., India, which includes the dists. of Raipur, Bilaspur, and Sambalpur. The total area is 25,013 sq. m. Large quantities of Indian corn are cultivated.

Chhindwara, or **Chindwara**, dist. in the Central Provs., India, with an area of 4630 sq. m. The cap. tn. is C., situated on a plateau rising 2200 ft. above sea level, and 70 m. N.W. of Nagpur. The climate is generally considered healthy.

Chhota Udaipur, state in Rewa Kantha, in Gujarat, Bombay Presidency, India, with an area of about 870 sq. m. The country is hilly, with a thick growth of forest, and the climate in most parts is unhealthy. Chhota Udaipur is the cap.

Chiabrera, Gabriello (1552-1637), It. poet, b. at Savona, and founder of the I'ndiar school of poetry. He wrote many odes, lyrics, and *canzonetti*, which are full of mythologic allusions and affectations, the error of the times in which he lived. His best poetry is to be found in the *canzonetti* and *scherzi* written for music. Some of his *canzonetti*, like the anacreontics of Ronsard, are most elegant and graceful. Some of his epitaphs have been trans. by Wordsworth. There were eds. of his lyric work pub. in Rome (1718), Venice (1731), Leghorn (1781), and Milan (1807). All the rest of his work has long sunk into oblivion.

Chlachou, see **TSINGTAO**.

Chiamdo, see **CHAMDO**.

Chiana, Val di (in Italy), one of the most fertile spots in Tuscany, situated about 25 m. S. of Arezzo. It possesses a watercourse, partly natural, partly artificial. About the end of the eighteenth century engineering operations were started so that the waters of the R. C. should discharge themselves into the Arno as well as the Tiber, thus helping to drain the valley.

Chianfu, or Kianfu, tn. in Kiangsi prov., China, situated on a trib. of the Kan R.

Chiang Kai-shek (b. 1886). Chinese marshal, b. in Ningpo. Whilst quite a youth he identified himself with the Kuomintang, but it was not until he was thirty-four that he gained a position of prominence by being appointed to the headship of the Whampoa Cadet School. At this period Borodin, the Russian Soviet agent in China, dominated Chinese affairs in an endeavour to model the

of the Military Affairs Commission; but his power again declined in 1933 when Dr. Sun-to, son of Sun Yat-sen, became president of the Yuan (legislative body). C. apparently favoured closer relations with Japan, but Soong, the foreign minister, wanted better relations with Britain and America. But later, as C.'s lectures to the Officers' Training Corps at Kuling in 1934 showed, he cited Japan as the flagrant and inevitable enemy of China and made it his dominating mission



MARSHAL AND MADAME CHIANG KAI-SHEK

country on Soviet lines. When Sun Yat-sen d. in 1925 C. was appointed commander-in-chief, but he was to some extent under Russian influence and the Russian Soviet general, Galen, was his chief of staff. Towards the end of 1925 he waged a successful campaign against Chen Chiung-ming, which led to the formation of the Nationalist Gov. In the following year he set up an administration at Wuchang. His success was due as much to an army of trained agitators who prepared the way for him, as to his skill at arms. His succession of victories and growing prestige stimulated in him a desire to throw off all external restraint and to give his cause a truly Chinese national character; and to this end he cleared the country of his Russian advisers. In 1927, however, he retired, but on the anniversary of the revolution, Oct. 10, 1928 he assumed office as president. In 1931, under the gov. of Lin-Shen, he was made president

in life to unite China—a strange conversion after having spent ten years waging a series of civil wars against his own people. By this time he was commander-in-chief of all the forces of China, president of the National Military Council, president of the National Aviation Commission, 'Tsunghai' or director general of the Kuomintang, and, in fact, as popular leader, in spite of his inconsistent politics, of the rank of Mussolini or Stalin. He is psychologically a strange man—a Christian imbued with a granite-hard puritanism, a disciplinarian who seldom laughs and has no relaxation, a man of infinite patience, calm, stubborn, and secretive. It may be noted that the members of his wife's family, the notable Soongs, are Methodists. There seems to be no doubt that his apparently defeatist attitude of supine submission to Jap. designs in 1932-33 was due really to his longer vision and his realisation of the necessity of uniting China before pursuing his real

end—the expulsion of Japan. He has done more than any other man in China to instill into the Chinese a sense of national unity and to inspire them to fight as a united nation, even if they are repeatedly defeated—for C., like the soul of his country, thinks in terms, not of decades, but of centuries. He became president of the Executive Yuan in 1935 and was president of China from 1943 until 1949. By 1937 C., in sev. hard-fought campaigns, succeeded in unifying China once more under the Kuomintang, and in the Second World War he continued to lead until the defeat of Japan. But thereafter his political fortunes suffered eclipse owing to the maladministration of the Kuomintang Gov. and the incapacity of the Nationalist generals in face of the Communist invasion. Following the loss of Manchuria and Peiping, C. sought peace with the Communists (Jan. 1949) but without success owing to the 'no surrender' attitude of C. and a group of his adherents. See R. Payne, *Chiang Kai-shek: the Generalissimo*, 1948.

Chiangyin, or **Kiangyin**, tn. in the prov. of Kiangsu, China. It stands in a strongly fortified position commanding a narrow part of the Yangtze River, distant 80 m. from Shanghai.

Chianti, group of mts. in Italy, near Siena, belonging to the Apennines. The slopes are occupied by vineyards, olive and mulberry plantations, and a celebrated wine takes its name from it.

Chiaochou, or **Kiaochou**, see TSINGTAO.

Chiapas, Pacific state of Mexico, bounded on the W. side by Vera Cruz and Oaxaca, area 28,700 sq. m. It is mountainous, especially in the N. and S.E., one of the highest peaks being Tacana, 13,940 ft., an active volcano, and another, the Soconusco, 7450 ft. On the E. side stretches an undulating plateau, well wooded, with a plentiful water supply. Agriculture and fruit farming flourish, and stock-raising is an important industry. Cap. is Tuxtla Gutiérrez. Pop. 680,000.

Chiaromonte, tn. of Sicily, situated 30 m. W. of Syracuse; it is noted for its wine trade. Pop. 16,000.

Chiari, tn. of Italy in Lombardy; 14 m. W. of Brescia. In 1701 Prince Eugène of Savoy here defeated the Fr. and Spaniards. There are manufactures of silk and twist. Pop. 13,000.

Chiari, Pietro (1700-88), It. writer, who was b. and d. at Brescia. He started his career as a Jesuit priest, but soon became a writer of plays, of which he produced sixty in twelve years, *Commedie*, pub. in 1756-62, and *Nuova Raccolta* (1762). They are full of absurd intrigues and plots, and abounding in irregular invention.

Chiarini, Giuseppe (1833-1908), It. poet and critic, b. at Arezzo. For some time he was the director of the lyceum at Leghorn, and in 1884 was made director of the Liceo Umberto I. at Rome. His poems are full of charm and tenderness, especially his *In Memoriam* (1875), and *Lacrime* (1879), and the influence of Carducci is felt, whose principles he strongly advocated. A complete ed.

of his works was pub. in 1902. The *Studi Shakespeariani* is a collection of his papers on Shakespeare.

Chiaroscuro (Lat. *clarus*, bright, and *obscurus*, dark), in painting, a term used to express the art of reproducing colour in light and in shadow, so that the one is always present in the other. It is C. which gives perfect proportion to a picture, and only the great masters, such as Raphael, Titian, Correggio, and Rembrandt, have attained to it. See also ENGRAVING.

Chialtolite, variety of the mineral andalusite (q.v.), which consists of silicate of alumina. Crystals of C. are long, narrow, and grey or white in colour. When broken across they often exhibit a cruciform pattern, and cut and polished crystals, giving a black cross on a lighter ground, are often worn as amulets by Sp. peasants. This pattern is caused by the fact that the outer portion encloses a darker one of regular geometric form. C. is met with in certain slates altered by the intrusion of igneous rock.

Chiatingfu, or **Kiatingfu**, in Szechwan prov., China, tn. situated on the r. b. of the Min R., where it joins the Tatu R. It is a centre of the silk-weaving industry.

Chiavenna, tn. in Lombardy, Italy, on the little R. Mera, not far from Lake Como. It commands a view of the famous Splügen and Maloja passes, and is looked upon as one of the keys of N. Italy. The Splügen route runs N. from C. to Coire, and a new road was made by the Austrians in 1819. Celebrated for its breweries, and carries on trade with Switzerland. Pop. 5000.

Chiayukuan, or **Kiayukuan**, tn. of Kansu prov. in China, situated at the W. end of the Great Wall, near Suchow.

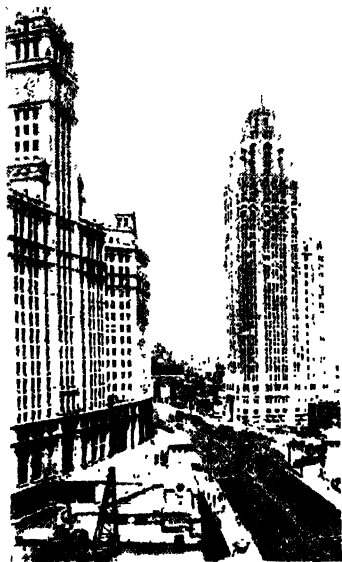
Chiba, city of Hondo, Japan, situated on Tokyo Bay, 20 m. E. of Tokyo. Pop. 41,500.

Chibchas, or **Muyscas**, one of the civilised nations of S. America, whose kingdom at the time of the conquest consisted of the plateau of Cundinamarca and some surrounding dists. of Colombia. The nation was divided into two separate states, which were hostile to one another. One was governed by the *cipa*, or king, of Bacata, and the other by the *zaque*, or lord, of Ramiriqui and Hunsa. Their total pop. amounted to over one million. They now no longer exist, having been overthrown in 1538. Evidence of their great culture is seen in their stone temples, highways, statues, suspension bridges, and their beautiful gold and silver work, also their weaving and dyeing.

Chica, colouring matter of an orange-red shade which is obtained from a native plant (*Bignonia Chica*), and made into a pigment by the Indians of the Upper Orinoco and Rio Negro; it is used by them to adorn their bodies. The name is also used for a beer in S. America.

Chicacole, tn. of India, in the Ganjam dist. of the Madras Presidency, situated on the R. Languliya. It is a holy town of the Muslims of India. It was once famous for muslins, but the industry is no longer carried on. There are sev. old Moslem mosques. Pop. 18,000.

Chicago, cap. of Cook co. in the state of Illinois, U.S.A. It lies on the extreme S.W. shore of Lake Michigan, its lat. being $41^{\circ} 53' N.$ and its long. $87^{\circ} 37' W.$ Its distance W. of New York is about 911 m., and N.W. of Washington about 100 m. less. The city occupies an important position, being a large railway centre, and consequently carrying on an enormous trade with other large places, so that it is now the second city of the U.S.A. The area of C. is about 204 sq. m., and it is built along the shore of Lake Michigan. The land on which it is built



MICHIGAN AVENUE, CHICAGO

is extremely flat, scarcely rising above the level of the lake. The C. R. divides it into dists. known as the N., W., and S. parts, characterised by long, regular, and straight streets. Great improvements have been made to the old city, although some slum dists. remain. Streets have been widened, bridges built, and boulevards constructed; land has been reclaimed from the lake for the formation of new parks, bathing beaches, and lagoons. The business quarter of the city lies in the S., and has a number of fine streets, among the largest and most important being State, Madison, La Salle, Clark, Wabash Avenue, and Dearborn, while Michigan Avenue, Grand Boulevards, Drexel, and Lake Shore Drive are some of the prin. ones in the residential quarter. Here the houses are mostly built with a framework of steel, as in the case of those used as offices, the latter towering up to

tremendous heights, and accommodating at the same time a large number of people. Among the most important buildings in the business quarter may be mentioned the Chamber of Commerce, which is fourteen storeys high. The city hall and court house is a double building, the erection of which cost considerably over \$4,000,000, and close to it is a statue of Columbus. Others of considerable importance are the Board of Trade, a granite building with a tower over 300 ft. high; the Rookery, the Tacoma, the New York Life Insurance Building, and the Illinois Trust and Savings Bank. The new Federal Building, occupying a complete block, is situated quite close to the Great Northern Hotel, the Manhattan, the Monadnock, and the Monon, four immense buildings, while the offices of Marshall Field & Company, the Masonic Temple, and many theatres and concert halls are also worthy of note. In addition to these is the Auditorium, containing a theatre and an hotel, the Art Institute, containing a valuable collection of pictures and other treasures, the public library, the Chicago Historical Society, and the Newberry Library. The Chicago Univ. (q.v.), which dates from 1892, was endowed by John D. Rockefeller and has faculties of science, arts, commerce, and law. It is housed in buildings which occupy 100 ac. of ground in the Midway Plaisance. The univ. has greatly developed in recent years, notably on the medical side. There are also many other educational buildings, including schools of theology, medicine, law, and sev. others. C. is well provided with parks, occupying in all over 8000 ac and connected by means of the boulevards. The chief of these are Lincoln Park at the end of Lake Shore Drive and containing a statue of Lincoln; Washington Park, which is connected with Jackson Park by the Midway Plaisance, the latter park being the site of the World's Columbian Exposition in 1893. The Field Columbian Museum was also situated in this park until its new buildings beside the lake were completed in 1920. Among the W. side parks are Douglas Park, Garfield Park, which possesses a conservatory, Humboldt Park, and Lake Front Park, which joins the business quarter of the tn. There are also many hospitals and institutions of various kinds in this city, the chief one being Cook Co. Hospital; another is the Presbyterian Hospital. The other institutions include Armour Institute, Lewis Institute, Hull House, a social settlement planned on the lines of Toynbee Hall, and many asylums, nurseries, and homes. The water supply of the city is extremely good, owing to the construction of a number of tunnels, the prin. of which extends 4 m. into Lake Michigan, while the sewage of the city is carried by a canal into the Illinois R. This canal, which cost \$75,000,000, was opened in 1900, and connects the C. R. with the Des Plaines R., and finally with the Illinois. C. owes its great advance in commercial activity to its advantageous position. In addition to its being on the Great Lakes, it is in such a position as to be an extremely

good railway centre, and, being served by twenty-seven railway systems, is by this means connected with all parts of the U.S.A. There are also steamship lines with regular services connecting it with other places on the lakes, while in addition it ranks among the largest commercial ports in the world—ships of over 7000 tons being able to enter the harbour—there is, in fact, no other Amer. city, with the exception of New York, that does a larger trade. C.'s retail trade, according to the census of 1929, amounted to \$2,127,520,000 in net sales. The city's foreign trade is mainly by rail through other ports, although vessels of less than 14-ft. draught can reach C. Imports for the fiscal year 1934 amounted to \$29,621,000. Direct exports for the fiscal year 1934 were valued at \$5,500,000. Just N. of the mouth of the C. R., a new pier, 3000 ft. long, was completed in 1915. Ships can also moor in the riv. and its branches. The chief sources of the city's wealth are grain, live-stock, lumber, and meat; as for these products it holds the premier place. The grain, which has reached a total of 300,000,000 bushels per annum, consists chiefly of corn, oats, and barley, and the enormous grain elevators are a feature of the city. The union stock-yards, which are situated in the S.W. part of the city, are also worthy of notice, as they constitute the largest live-stock market in the world, employing as many as 25,000 workers and having accommodation for hundreds of thousands of animals. In these yards the animals are slaughtered, and large quantities of canned meat, glue, butterine, and other products are turned out from them. In addition to this all kinds of manufs. are carried on in C., including iron and steel products, electrical machinery, foundry products, cars, agric. implements, clothing, bread and bakery, and furniture. Printing and publishing are other important industries. Thousands of harvesting machines are made, the two largest firms being the Deering Company and the International Harvester Company, successor to the McCormick Harvesting Machine Company, and the largest manufacturer of agric. machinery in the world. Pullman, situated in the S. of C., is a model tn. built by the Pullman Car Company, and here are the Pullman car works, at which are produced the railway cars known by that name. The Western Electric Company is the largest manufacturer of telephone equipment in the world. There are in all about 1000 manufacturing works in C. The gov. of C. is regulated by a general charter law of 1875, the power being vested in a council elected from the wards. The mayor, who is elected for seven years, is at the head of the council, and has the power of appointing single commissioners to rule the different depts., all of which are under the power of the council. The growth of pop. in C. is remarkable, its increase during the period 1890-1930 being from 503,000 to over 3,000,000. It is now the second largest city in the U.S.A. and the fifth largest in

the world. There is also a large percentage of foreigners in the city, including Bohemians, Gers., Swedes, Norwegians, Poles, Its., and Russians; indeed, in 1910 little over a quarter of the pop. were of Amer. birth and descent. The origin of the name of the city is uncertain, but is said to be derived from Ojibwa *she-kag-onp*, meaning 'wild onion place.' The site was in 1673 visited by Joliet and Marquette, and, after the giving up of a piece of land to the gov. near the end of the next century, Fort Dearborn was built in 1803. In 1812 the Indians massacred the settlers. C. was rebuilt very shortly afterwards, and by the year 1837 had received its charter as a city. In 1871 nearly the whole city was swept by fire, and the loss was tremendous. It was, however, soon restored, and was furnished with buildings of much better construction. In May 1886 occurred the Haymarket riot in which a bomb was thrown among the police force who were trying to put down an anarchist meeting, called owing to troubles in the labour world. Owing to the low number of European immigrants during the years of the First World War, there was a great influx of unskilled Negro labour from the S. Difficulties caused by the return to normal conditions and the bad state of housing combined to cause a serious race riot in 1919, when, on one day, 38 people were killed and 543 injured. From about the same period dates C.'s extraordinary crime wave. C. has never been a city noted for its orderliness, which, considering the mixed pop. and the large element of rough characters employed in slaughtering yards, packing mills, etc., is hardly to be expected; but from a time roughly coincidental with the enforcement of prohibition, crime and violence alarmingly increased. Gambling and bootlegging were the two main factors of violence in the city, and enmity between rival gangs led to frequent shootings, the police or any one else inclined to interfere being also shot down. During the First World War C. attracted attention through the anti-war, anti-Brit. attitude of its mayor, Wm. Hale Thompson, who was first elected in 1915. In 1935 C.'s revenues were disorganised as the result of the worst economic depression in the hist. of the city. The full effect of the depression of 1929 struck C. in the period of a general reassessment of real property to remove great inequalities of tax burden, and on Jan. 1, 1934, the gross city debt was \$383,158,000 or \$113 *per capita*, not a heavy burden if compared with that of New York, but vexatious on account of deficient and disorganised revenue. In May 1934 a fire broke out in the Union stock-yards, and, spreading through forty blocks of the S. side, at one time threatened the whole city. This was the most disastrous fire in C. since that of 1871, the most important meat-packing centre in the U.S.A. being destroyed, the total damage being estimated at \$25,000,000. The land area of C. in 1916 was returned at 132,297 ac. C. is the headquarters of one of the six army areas. In 1920 the

pop. was 2,701,705, in 1930 3,376,438, and in 1940 3,396,808. See E. G. Mason, *Early Chicago and Illinois*, 1890; J. Kirkland, *The Story of Chicago*, 1892-94; E. D. Sullivan, *Look at Chicago*, 1930; E. L. Masters, *The Tale of Chicago*, 1933; F. Mather, *The Making of Illinois* (rev. ed.), 1942.

Chicago Heights, tn. in co. Cook, Illinois, U.S.A., 25 m. S. of Chicago. It has manufs. of chemicals, stoves, boilers, furniture, and pianos. Pop. 22,231.

Chicago River, which runs W. from Lake Michigan, is of great commercial importance, and with regard to its harbour is one of the greatest in the world. It is perhaps the most important of non-tidal rivs. of its length, having about 15 m. of navigable channel.

'**Chicago Tribune**.' This popular Amer. daily paper, which entitles itself 'the world's greatest newspaper,' is one of the greatest financial successes of the newspaper world of to-day. Early in the nineteenth century there existed a tiny paper, *The Gem of the Prairie*, which was later merged into the *Chicago Democrat* founded by John Calhoun in 1833, and from these arose the *Chicago Tribune*. The first issue was pub. on June 10, 1847, only 400 copies being printed, and the early years of the paper were full of financial vicissitudes. On one occasion it became bankrupt, but triumphantly overcame its difficulties and in less than two years paid off all its debts. In 1856 Joseph Medill bought an interest in the *Tribune* with two other purchasers, but it was not until 1874 that he took over the editorship from Horace White, who had been a part proprietor and ed.-in-chief since 1864. Medill's genius raised the paper to a position of power during the many years it was under his control. In 1901 Joseph Medill Patterson, grandson of Joseph Medill, joined the staff of the *Tribune*, while his cousin, Robert Rutherford McCormick, two years later followed him. The united energies and abilities of these two young men were responsible for the rapid rise in circulation of the *Tribune*, and the serious attention they paid to advertising of a reliable and reputable nature soon raised the paper's financial status to great heights. A feature of the paper's foreign policy in the years preceding America's entry into the Second World War was Col. McCormick's isolationist and anti-Brit. attitude.

Chicago, University of, was incorporated in 1892, the foundation being initially endowed by John D. Rockefeller, who acted through the Amer. Baptist Education Society. Subsequent gifts from the founder have exceeded \$30,000,000, and the permanent endowment is now over \$50,000,000. The U. of C. is situated on the Midway Plaisance in Chicago, Illinois, and occupies a number of imposing buildings, among which may be named the Wm. Rainey Harper Memorial Library, a specimen of Eng. Gothic architecture, and named after the first president to whose genius the U. of C. owes its initial success. The Yerkes Observatory at Williams Bay,

Wisconsin, is part of the univ., and Chicago house, Luxor, Egypt, was endowed by John D. Rockefeller, junior, for the furtherance of oriental study. Under the administration of Prof. Judson, who succeeded Harper in 1906, medical research was advanced, and the Rush Medical College became an organic part of the univ. Later, in 1924, a clinical laboratory was built. In addition to the faculties of classical, oriental, and literary studies and of branches of science, there are schools of law, of commerce and administration, and also a graduates school of social service administration. There are summer schools and extension courses, and also a summer quarter session, increasingly popular among graduate students. The U. of C. is open equally to men and women, the total enrolment being over 12,000. There is no religious discrimination among students, but the president, and also a two-thirds proportion of the trustees, are required to be members of the Baptist Church. The number of profs. and instructors is about 600. In 1930, in place of the traditional graduate schools and undergraduate college, a divisional organisation was estab., consisting of the college, four upper divs. in arts and sciences, and the professional schools. See T. W. Goodspeed, *The Story of the University of Chicago*, 1925.

Chichas, S. Amer. people of the Gran Chaco, Argentina, who are not at all similar to the other tribes who dwell in that region, and who are mostly of plundering habits. They have their own settlements, and cultivate the land in the Upper Bermejo dist., where they were known as 'mitinaes,' or Peruvian colonists. They dress in a cloth which they weave themselves from the llama wool, and the Incas are said to have employed them in silver mines.

Chichele, or **Chicheley**, Henry (1364-1443), Eng. archbishop and founder of All Souls' College, Oxford. He was b. at Higham Ferrers, Northampton, and was the youngest son of Thomas C. He was educated at Winchester, and went to New College, Oxford, in 1387. Three times he went as ambas. to France, and on his return the last time, in 1414, he was made archbishop of Canterbury. The official record of his pontificate, *The Register of Henry Chichele*, ed. by C. F. Jacob, was pub. in 4 vols. (1932).

Chichen, or **Chichenitzá**, ruined city in Yucatán, Mexico, 100 m. S. E. of Merida. At one time it was apparently a place of religious importance, as there are many evidences of early civilisation in the time of the Itzas, a most powerful Maya nation, who were still inhabiting the city at the time of the Sp. conquest. There is a nunnery, a castle, and a central pyramid, the latter being 550 ft. sq., with a height of 70 ft.

Chicherin, Yury Vasilievitch (1872-1936), Russian statesman; was b. in 1872 in the prov. of Karaul Tambov; educated at a higher school and at St. Petersburg Univ., and then entered the archives dept. of the Foreign Office. Left the service in 1904, and went to Berlin,

where he joined the Social Democratic party. Active for many years in the revolutionary movements of England, France, and Germany, he became, in 1907, secretary of the foreign central bureau of the Russian Social Democratic party. In that year he was banished from Prussia in connection with a discovery of falsified passports. In England during the First World War he assisted Russian political refugees. After the Bolshevik rising of Nov. 1917 he was imprisoned in Brixton jail for having enemy associations. In Jan. 1918 he was released and banished, having been exchanged for Sir George Buchanan. In the following March he became temporary commissary for foreign affairs, but proved more permanent than any other foreign minister in Europe. In 1922 he was chief of the Soviet delegation to the conference at Genoa. He spent most of 1929 in Germany, was extruded from the Politburo by the Zinoviev party, and resigned.

Chichester, cathedral city and municipal bor., cap. of W. Sussex, 28 m. W. of Brighton. A city rich in historical associations, it is situated on a plain between the S. Downs and the sea. The name is derived from the Saxon Cissin-ceaster, 'Cissa's Camp,' and called so after a Saxon king who took it in 491. Originally a Rom. station, it was demolished by the S. Saxons towards the end of the fifth century. A wooden cathedral was erected at C. in 1108, and burnt down in 1114. Another cathedral was built on the same site in the twelfth and thirteenth centuries. It represents different periods of architecture, the choir above the arcade and the E. part containing excellent workmanship of the Early Eng. period. The special features of the cathedral lie in its nave with double aisles on each side, a detached campanile or bell-tower, and a number of portraits of the Eng. kings from the time of the Conquest and of many bishops. The spire is 300 ft. high. Sir Gilbert Scott and others undertook the restoration of parts of the building, such as the central tower, a portion of the N.W. tower, and the spire. Early Decorated, Norman, Perpendicular, Early Eng., and Late Norman styles are all in evidence in this cathedral. The tn. itself has a fine market cross, octagonal in structure and belonging to the ornate Perpendicular style. The bishop's palace and cloisters are not far from the cathedral. Other buildings of interest are the church of St. Olave (Rom. workmanship), the Guildhall (formerly a Grey Friars' chapel), the church of St. Andrew (the poet Wm. Collins was buried here), and St. Paul's Church (a fine modern structure). C. has a fine cattle market, and the chief trade is agric. produce and live-stock. Brewing and tanning are also engaged in. There are Rom. remains here. Pop. 15,000.

Chickadee, black-cap titmouse, *Parus atricapillus*, a native of N. America. The name is onomatopoeic, imitating the note of the bird.

Chickahominy, riv. of Virginia, U.S.A.

It is a trib. of the James R., which it joins 22 m. below City Point. In 1862 the battles of Fair Oaks, Mechanicsville, Gaines's Mill, Savage's Station, White Oak Swamp, and in 1861 Cold Harbour, took place near the riv.

Chickamauga Creek, riv. which takes its rise in Walker co., Georgia, U.S.A., and flows into the Tennessee 6 m. above Chattanooga. The Confederates under Bragg defeated the Federals under Rosecrans in Sept. 1863 on the banks of the riv.

Chickasaws, tribe of N. Amer. Indians, allied to the Cherokees. They formerly occupied the N. Mississippi and parts of Alabama, but have since settled in Oklahoma, with autonomous gov. They were a very warlike race, and supported the Eng. against the Fr. At the end of the Civil war, they agreed to liberate their slaves. Of late years they have advanced considerably in culture, and many have received degrees at Amer. univs. The tribe numbers 5000.

Chickasha, or **Chicasaw**, tn., Grady co., Oklahoma, U.S.A., on the Chicago, Rock Is., and Pacific railroad. Its industries include lumber, cotton, and cotton-seed oil. Pop. 14,000.

Chicken, see POULTRY AND POULTRY KEEPING.

Chicken-pox, mild, feverish, and infectious disease, common among children. It can be distinguished by the appearance of small vesicles which may not be very numerous; these seldom become pustular, and dry up and drop off at about the fifth day, leaving very little of the pitting or scarring which follows smallpox. It is not a dangerous disease, the fever not being very high nor lasting. The period of infection ends when all the scabs have disappeared, and when the person affected has had an antiseptic bath. A theory of C. is that it is a modification through vaccination of smallpox, but it is not universally accepted.

Chick-Pea, or **Gram**, the *Cicer arictinum*, leguminous plant cultivated in India and S. Europe for food. It is bushy in habit, grows to a height of nearly 2 ft., has the pinnate leaves common to the order, and the pods are short, oblong, and two-seeded; the flowers of this annual are solitary and are of a pale violet colour. The seeds are about the size of an ordinary pea and bear a striking resemblance to a ram's head, hence the specific name. When boiled they form a nourishing article of diet, or when ground and made into pea-soup. In summer the plant exudes little viscid drops from the stem and leaves, and on evaporation these leave behind crystals of oxalic acid, to which its grateful refrigerating qualities are due. *Cajanus indicus*, a tropical leguminous plant, is sometimes known as C., its other names being Congo, or pigeon, pea and dahl. Its seeds also form an article of food, and are frequently used in curries.

Chickweed, title shared by sev. plants, but it is applied particularly to the caryophyllaceous plant, *Stellaria media*, an ally of the stitchwort, from which it is

distinguished by the double row of hairs in each internode. The flower is well known to please the palate of cage-birds, and it is a peculiarity of *S. media* that it obligingly flowers the whole year round. Other familiar plants bearing the above name are members of different genera; thus, *Cerastium* includes the field mouse-ear *C. (C. arvense)*, and the viscid mouse-ear *C. (C. viscosum)*, and the tropical genus *Drymaria* has a species known as *C. (D. cordata)*. *Holosteum umbellatum*, yet another caryophyllaceous plant, is called in America the jagged *C.*



Chiclana de la Frontera, tn. in Andalusia, Spain, on the Lirio, 12 m. S.E. of Cadiz. Near by is a ruined Moorish castle, and the mineral baths are much visited by the inhab. of Cadiz. Wines are exported, and linen and earthenware goods are manufactured. Pop. 12,000.

Chilayo, most important trading tn. in N. Peru. Cap. of Lambhek prov., with 30,000 inhab. and extensive sugar plantations.

Chiole, see under CHEWING-GUM.

Chico, city of S.W. California. Sugar growing is carried on in the dist. Pop. 10,000.

Chicopee: 1. Tn. of Hampden co., Massachusetts, U.S.A., on Connecticut R., 4 m. N. of Springfield. It has large manufs. of cotton (in the Dwight mills), bronzes, artillery, swords, tools, and motor cars. Pop. 41,500. 2. Riv., in the S. of Massachusetts, which flows in a westerly direction to join the Connecticut R. on its l. b. 4 m. N. of Springfield.

Chicory, *Succory*, or *Cichorium intybus*, is a composite plant common to the Mediterranean and Europe, and is in the same genus as the endive. The whole plant is bitter and aromatic, and the leaves as well as the root have been used in medicine, in the form of a decoction, as a tonic bitter and diuretic. The leaves are large and succulent, and are often

grown without light, when they become tender and delicate, and form a pleasant winter salad. But the cultivation of *C.* is carried on more for the sake of the roots than for the leaves, and these carrot-shaped parts of the plant are dried, roasted, and ground, and then mixed with coffee. It is much cheaper than coffee, and is sometimes used as a substitute.

Chicoutimi, tn. of Quebec, Canada, in co. of same name on R. Saguenay, 111 m. N.E. of Quebec. It has a large saw-milling industry. Pop. 9500.

Chicova, vil. and fort of Portuguese E. Africa, in a plain of the same name, on the Zambezi R., 220 m. N.W. of Senna. The plain is fertile, and there were formerly silver mines.

Chidambaram, **Chilambaram**, or **Chittambaram**, tn. of S. Arcot, Madras, India, 21 m. S.W. of Cuddalore. It is a religious centre for the whole of S. India and Ceylon, the most important among the numerous temples being that of Siva. The tn. was of some strategical importance during the wars of the Carnatic. Pop. 22,500.

Chidley, see CHUDLEIGH.

Chief, in heraldry, one of the honourable 'ordinaries,' which occupies one-third of the upper part of the field, defined by a horizontal line.

Chiemsee, lake of Upper Bavaria, Germany, 40 m. S.E. of Munich. It lies 1650 ft. above sea level, is about 12 m. long and 7 wide, and has an area of 34 sq. m. The greatest depth is rather over 500 ft. On the lake are the is. of Herrenworth, Frauenworth, and Krautinsel, fed by the Rs. Achen and Prien, and it discharges its surplus water by the Alz into the Inn.

Ch'ien-Fo-Tung, see CAVES OF A THOUSAND BUDDHAS.

Chieng-mai, or **Zimme**, tn. of Siam, in the Laos country, on the Meping R., 180 m. N.E. of Moumein (Burma). It is a centre of the trade in teak, the surrounding forests of which are, however, becoming exhausted.

Chieri, tn. of Turin prov., Piedmont, Italy, standing on a hill 9 m. S.E. of Turin. Formerly a fort. The most interesting building in the tn. is the church of Santa Maria della Scala, built in 1406. There are manufs. of textiles. Pop. 13,700.

Chieti: 1. Prov. of S. Italy, on the Adriatic. Area 1138 sq. m. The prov. is very mountainous, and was originally known as Abruzzo Citeriore. Pop. 385,300. 2. Cap. city of prov. of the same name. Abruzzi e Molise, Italy, built on a hill near the Pescara, 40 m. E. of Aquila and 8 m. from the Adriatic. It is an archiepiscopal seat, and contains a fine Gothic cathedral, a lyceum, and a theatre. It is built on the site of the anct. Rom. Teate, numerous remains of which still exist, including a large theatre and a gateway. Teate was the chief city of the Marrucini. In 1624 St. Gaetano founded here the order of the Theatines. Cloth and silk are manufactured there. Altitude 1070-80 ft. Mean temp. for year, 56° 3' F.; summer, 74° 8' F.; winter, 41° 0' F. Pop. 30,300.

Chiffchaff, or Lesser Pettychaps (*Phylloscopus rufus*), small song-bird, one of the earliest summer visitors to Britain, and nearly allied to the willow-wren. The head, wings, and back are greenish-ash colour and the nether parts yellow-white. Pettychaps is a name sometimes given to the garden warbler (*Sylvia hortensis*).

Chigger, see **CINCOE**.

Chigi, name of a distinguished It. family. Among its most famous members have been:

Agostino (1465-1520), the founder, a celebrated Rom. banker, b. at Siena; settled in Rome in 1485 and became enormously rich, his income being estimated at about £700,000 per annum. He was a patron of many famous artists, including Peruzzi, Perugino, Sebastiano del Pombo, and Raphael. See **Agostino Chigi**, *il Magnifico*, by Cugnoli (1881-83).

Fabio, pope (1652-67), better known as Alexander VII. He was prominent in the Jansenist controversy, declaring for papal infallibility. He was involved in a dispute with Louis XIV. of France, who sent an army to sack Avignon. He was responsible for the colonnade of the Square of St. Peter.

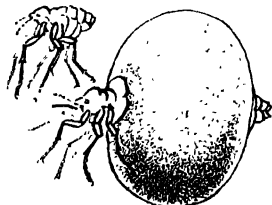
Flavio (1810-85), cardinal. Began life as an officer in the papal noble guard; in 1848 took orders and became bishop of Mira; in 1850 became papal nuncio at Munich; in 1856 was papal representative at the coronation of Alexander II. of Russia; in 1861 became papal nuncio at Paris, and in 1873 was created a cardinal.

Chigirin, or **Tchigirin**, tn. of Russia in the Kiev region of the Ukrainian S.S.R. It is situated on the R. Trasmin, 20 m. W. of Krilov. Pop. 11,000.

Chignecto Bay and Isthmus, inlet and neck of land which form the N. extremity of the bay of Fundy.

Chignola, tn. of Lombardy, Italy, situated 16 m. N.E. by E. of Piacenza. Pop. 5000.

Chignon (Fr. *chignon*, nape of the neck), form of hairdressing adopted by women about 1780, and again about 1870, consisting of an enormous coil of hair, folded round a pad, and worn in the nape of the neck or at the back of the head.



CHIGOE

Chigoe, **Chigger**, **Jigger**, and **Sandflea** are names applied to the *Sarcopsylla penetrans*, a species of Aphaniptera which is native to S. America and the W. Indies, but has extended its travels to other lands through the agency of man. The female of this flea, which is smaller

and has less powerful limbs than the common flea, buries the hinder part of its body under the skin of the human body, and when this portion of its anatomy swells it discharges numerous eggs into the host. The result of this process is frequently fraught with serious and even fatal danger to mankind. *S. gallinacea*, a kindred species, attaches itself to the eyelids of the poultry of Ceylon. See also **FLEA**.

Chigwell, urb. dist. of Essex, England, 13 m. N.E. of London, on the borders of Hainault forest. It contains a grammar school at which Penn was a pupil, founded in 1629 by Archbishop Harpsnet of York, and enlarged in 1871. The Maypole Inn appears in Dickens's *Barnaby Rudge*. Pop. 18,000.

Chihli, or **Chili**, or **Pechili**, prov. of China, see **HOPEI**.

Chihuahua: 1. The largest state of Mexico, bounded on the N. by New Mexico, on the S. by Durango, on the E. by Coahuila and Texas, and on the W. by Sinaloa and Sonora. Area 89,998 sq. m. On the W. the country is traversed by the Sierra Madre or Mexican Cordillera, and in the E. lies the Mexican plateau, and the depression known as Bolson de Mapimi. The chief industry is stock-raising, but mining is carried on, the chief minerals found being silver, gold, and copper. The soil is fertile, the chief products being maize, wheat, beans, and recently cotton. Pop. 490,000, consisting chiefly of mestizos (half-breeds) and Indians. 2. Cap. of the above state, on the Mexican central railway, situated at an elevation of 4650 ft. The city was founded in 1539, and has become an important centre of trade and silver-mining enterprise. There are cotton and woollen mills, and some fine buildings, including a par. church, Jesuit college, a mint, and a prison. Hidalgo and Allende, leaders of the revolution of 1810, were executed here, and a monument to their memory stands in the public square. Pop. 60,000.

Chikislar, port of Turkmenia, Russia, on the E. coast of the Caspian Sea, N. of the mouth of the Atrek, 200 m. S.E. of Krasnovodsk.

Chilambaram, see **CHIDAMBARAM**.

Chilas, fort. tn. of N.W. Frontier Prov., Pakistan, on R. Indus, 35 m. S.W. of Gilgit. The cap. of a small state lying between the N. frontier of Kashmir and the Indus, it occupies an important military position with regard to the Kashmir-Gilgit route, and was occupied by the Brit. in 1893.

Chilblain, **Frostbite**, or **Kibe** (*Erythema pernio*), local inflammation of the skin, which appears on the hands and feet more rarely on the nose, cheeks, and ears. It chiefly affects children (girls rather than boys) and old people, and occurs in cold weather. It is due to exposure to the cold and to bad circulation. It is attended with redness and swelling, the centre of which deepens to a purplish hue. In severe cases, small vesicles rise on the surface of the skin and ulceration follows. Cs. cause intense irritation, and,

when chilled and suddenly heated again, are extremely painful. It is generally thought that they are due to deficient nutrition or bad health, and therefore tonic and outdoor exercise are often recommended as a remedy. The part of the body affected should be kept very warmly and loosely clad. The treatment is to paint the Cs. with collodion, or an ointment consisting of chlorate of calcium 3 drachms, pure vaseline 3 oz. Lactate of calcium in the form of an elixir may be taken thrice daily in teaspoon doses. Alcohol and excess of salt in diet should be avoided. Warm electric baths have also been urged as a cure. Broken Cs. should be kept scrupulously clean and dressed with pure ointment or lint.

Child. In structure and functioning the C.'s body is similar to that of the adult. Organs similar to those found in an adult can be found in the child, and they will be found to function in a generally similar manner. Differences can be noticed in details, and the infant shows marked differences which become less marked as childhood progresses. The infant has, in proportion to the adult, a relatively large head and abdomen, small thorax and short legs, and long arms. At birth, the head is one quarter of the height, while in the adult it is only one-eighth of the height.

The skeleton of the child differs so much from that of an adult that an anatomist can, with a great amount of accuracy, determine the age of a skeleton, up to about twenty-four years. The difference, of course, is greatest, as in all cases, in infancy. Bones consist of organic matter allied to lime salts. In the child the proportion of lime salts to organic matter is much smaller than it is in the adult. Further, the bones of a child have provisions made for growth. A familiar example of this difference between the child and the adult is the fontanelle, or 'opening in the head.' With the growth of the skull this disappears at about the eighteenth month, because the bones growing irregularly at their edges meet and fit into one another, forming what is called a suture, since the bones look then as if they had been stitched together. Again, at birth many of the bones of the body are not formed. They consist then of long rods of cartilage, a tough substance which can be cut with a knife. Lime salts are deposited on these in definite places, forming bone, until they consist of a bony shaft connected to the bony extremities by plates of cartilage. All through childhood the bone remains in this condition, but as maturity is reached the cartilage ceases to grow as rapidly as the bone, and finally disappears, the extremities joining with the shaft, and growth of the bone in length stops. The bone grows in thickness also, by means of a surrounding tough membrane, called a periosteum. New bone is formed in the deeper portions of this, and at the same time the centre of the bone is absorbed, leaving the hollow wherein rests the bone marrow. Those differences give rise to peculiarities e.g. a

C.'s bone may partially break (greenstick fracture); whereas in the adult a break snaps the bone, in a child the bone may merely bend. Again, the extremity may be separated from the shaft by the breaking of the cartilage. This can only happen to children, and may have serious consequences, since it affects the growth of the bone. The teeth of the C. at birth are hidden in the dental sacs, which are in the depressions in the jaws.

Alimentary System.—The obvious point of difference between the infant and the adult with regard to the digestive organs is the absence of teeth. At birth the milk teeth are present in the gums, and teething usually commences at about the sixth month. The lower central incisors are the first to appear, and these are followed between the eighth and tenth month by the four upper incisors. The two remaining lower incisors and the four first pre-molars follow between the twelfth and fourteenth month. After a while the four eye-teeth appear at about the eighteenth month, and after a fairly long interval the set of twenty milk teeth is completed by the appearance of the four second pre-molars at the age of about two and a half years. This general order is not, of course, universally true, but in general it may be stated as such. In the same way the second dentition, giving rise to the permanent teeth, begins at about the sixth year, and continues at the rate of four teeth a year until the twelfth year, giving rise to twenty-eight teeth. The full set of thirty-two is usually completed some time between the seventeenth and twenty-fifth year by the appearance of the wisdom teeth (the third molars). Another point which may be noted is that the stomach lies obliquely in infancy, so causing vomiting to be easier and accompanied by less strain than it is in adults. The capacity of the stomach, and therefore the amount of milk which is required for each feeding, may be taken in general as being as follows: at birth from 1 to 1½ oz., at three months 4 oz., at six months 6 oz., at nine months 7 oz., and at twelve months 8 oz. Again, a C. at birth is unable to digest starch. This is due to the absence of saliva, and this, and the consequent power to convert starch into sugar, only comes with the arrival of the teeth. During the first nine months the child should be fed almost entirely on its mother's milk. The superiority of human milk over all other foods for infants, from the point of view of digestibility and nutritive value, is the unquestioned verdict of all authorities, and rests upon experience. Indigestion and colic are perhaps the minor disorders induced by bottle-feeding, but the results, especially in cases where bottle-feeding is injudiciously used may be taken as adding greatly to the infant mortality rates of our large towns. In those cases where artificial feeding must be resorted to, the best substitute for human milk is some modification of cow's milk, in which the constituents are brought to a nearer proportion to those of human milk. Milk

is an emulsion, owing its white colour to globules of fat. The following table shows the varying composition of human milk compared with cow's milk:

	Human Milk	Cow's Milk	Cream
Fat	4	3-4	8-20
Sugar	7	4-3	4
Proteins	1.5	4	3.4
Salts	0.2	0.7	0.6
Water	87.3	87	81-72
	100.0	100.0	100.0

Cow's milk differs in this respect, too, that the protein contained is not nearly so digestible as that in human milk, a dense curd being formed in the C.'s stomach, while when fed on human milk a flocculent, easily digestible curd is formed. To make cow's milk of the desired quality it must be diluted to reduce the proportion of protein, and cream and sugar of milk added. Cow's milk should *invariably* be boiled before being given to any child up to the age of twelve years, owing to the very serious danger of tuberculosis. At about the seventh month some additions of starch foods should be made once or twice a day. They should not result in a diminution of the quantity of milk taken because they are deficient in fat. Between the tenth and eighteenth months the chief food should still be cow's milk specially prepared with the addition of other foods, such as porridge, puddings, eggs, etc. Up to the sixth year a large amount of milk should be included in the dietary, which should consist of four meals a day. School children require abundant feeding, and sweetmeats are an excellent addition as they provide both sugar and fat.

Respiration and Circulation.—The lungs of a C. begin to expand with its first cry. The process of inflation then goes on very gradually, and the lungs do not attain their full expansion until the sixth year. Fresh air and exercise are essential for the possession of healthy lungs, and at the same time, by producing active movements of the chest and diaphragm, the action of the heart is aided. Clothes should be loose in childhood, and free exercise of the voice should not only be allowed but encouraged.

body. It is not fully developed, convulsions following as the result of sense impressions. The brain grows rapidly in size until the seventh year; the greatest

growth occurring during the first year. After this period growth in weight slowly goes on until the adult stage is reached. It is to allow for this growth that the fontanelle or 'opening in the head' occurs. The skull around the brain case consists of eight bones, partially developed at birth, but all joined up in the adult. The fontanelle on the top of the head is the last to close, and if it has not closed by the twentieth month, then either the brain is continuing growth, or rickets has intervened. Before birth the impressions reaching the brain are few in number, but as soon as the C. enters the world, it is immersed in a flood of impressions. These cause the brain to develop. The different areas of the brain are all busy storing up impressions both sensory and motor, and association fibres are laid down which bring the different areas into relation with each other. It is easy to understand, then, that the nervous system is unstable and excitable, and that the power of control is very feeble. So headaches, convulsions, screaming fits, etc., can arise from trivial causes, and it is therefore necessary to protect a C. from unnatural excitement, and that the diet should not only be simple, but should exclude all stimulants, such as alcohol, coffee, and tea. Sleep, rest, and quiet should be provided, and all possible forms of excitement as far as possible, prevented. In later childhood, both naturally nervous and rapidly growing children require very careful treatment.

The growth of the child.—At birth the C. should weigh about 7 lb., although 8 to 9 lb. is not uncommon. Then a steady increase in weight and height during childhood. This growth is not uniform. During the first few days a loss in weight

	Boys	Girls
First childhood	Up to 7 years	Up to 6 to 7 years
Later childhood	From 7 to 12 years	From 7 to 10 years
Adolescence	" 12 " 15 "	" 10 " 13 "
Puberty	" 15 " 16 "	" 13 " 14 "

Nervous System.—As has been stated before, the head is relatively very big and the face small in an infant, and this large size is due to the brain case. Its brain is enormous in proportion to the size of the

occurs which is made up by about the middle of the second week. During the first five months the daily increase should be from $\frac{1}{2}$ to 1 oz., and from $\frac{1}{2}$ to 1 oz. for the rest of the first year. At six months

the weight should be doubled, and trebled at twelve months. At birth the infant is about 20 in. in length, and at the end of the first year it should be 8 in. taller, although it takes six years to double the height at birth. The increase in height is not as useful as an index of health as the increase in weight. From the appended table it may be noticed that with both boys and girls the most rapid growth occurs during the first year. At about the sixth and eleventh years occur further periods of rapid growth. Boys are heavier and taller than girls at birth, and always, excepting the thirteenth to fifteenth years when the girls are heavier, having grown more rapidly in weight from the eleventh to the thirteenth year. Between

stage is reached an infant has a great tendency to take everything to its mouth. Again, an infant is sensitive to changes of temp. Sight is present at birth, but the C.'s eyes may move independently, as may the eyelids, and there is no power of focusing. Further, they are usually only half open for the first few days, and a bright light may cause discomfort. Whether the C. really sees or not can only be verified when he follows a slowly moving object with his eyes. When this happens, then the C. begins to watch objects and persons, and soon begins to show pleasure in certain colours, thus showing the development of the sensation of colour. A sense of distance and conception of solidity depend upon a

AGE	BOYS		GIRLS	
	Height	Weight	Height	Weight
Birth	20.6 inches	7.55 lb.	20.5 inches	7.16 lb.
6 months	25.4 "	16.0 "	25.0 "	15.5 "
12 "	29.0 "	20.5 "	28.7 "	19.8 "
18 "	30.0 "	22.8 "	29.7 "	22.0 "
2 years	32.5 "	26.5 "	32.5 "	25.5 "
3 "	35.0 "	31.2 "	35.0 "	30.0 "
4 "	38.0 "	35.0 "	38.0 "	34.0 "
5 "	41.7 "	41.2 "	41.4 "	39.8 "
6 "	44.1 "	45.1 "	43.6 "	43.8 "
7 "	46.2 "	49.5 "	45.9 "	48.0 "
8 "	48.2 "	51.5 "	48.0 "	52.9 "
9 "	50.1 "	60.0 "	49.6 "	57.5 "
10 "	52.2 "	66.6 "	51.8 "	64.1 "
11 "	54.0 "	72.4 "	53.8 "	70.3 "
12 "	55.8 "	79.8 "	57.1 "	81.4 "
13 "	58.2 "	88.3 "	58.7 "	91.2 "
14 "	61.0 "	99.3 "	60.3 "	100.3 "
15 "	63.0 "	110.8 "	61.4 "	108.4 "

the twelfth and fourteenth years the girls are taller, but at all other times the boys are superior in height and weight. It may further be noticed that the increase in weight takes place between the intervals of greatest increase in height. Here it may also be pointed out that generally childhood can be divided into four periods as shown in the table on p. 564.

The table above, from *The Child: his Nature and Nurture*, by W. B. Drummond (1915), shows the increase in height and weight from birth to the fifteenth year.

Mental Development.—At birth a C. is unable to interpret impressions arriving at the brain through the senses. The only way to judge as to the activity of the senses at birth is by the effects of stimulation as shown through movement. Taste is probably the first sense developed. Since smell is so closely linked up with taste it may be, and appears to be, present soon after birth. The sense of touch, however, is present almost from birth. It is present in a vague form before, and progresses rapidly. It is particularly developed in the lips and the tongue, and afterwards, of course, develops until the hand becomes the organ of touch. Until this

co-ordination of the senses of touch and sight. The sense of distance is very vague until the C. is a few years old, and while the recognition of solid forms is developed rapidly for near objects, this also remains vague for distant objects. Hearing, again, is absent at the time of birth, because there is no air in the drums of the ears. Loud sounds do not disturb, usually, until the third day or so, and, of course, this enables the C. to sleep without being disturbed. The power of localising sound may be developed by the fourteenth day, but not to any very great extent. From this and other observations it may be seen that the training of the eye should be aided by the training of the hand, and similarly it appears that speech depends on hearing. The lower senses, i.e. taste, smell, and touch, of course, enable the C. to develop sensations of hunger, thirst, warmth, the wholesomeness of food, etc. For a while after birth a C.'s movements may be classified as either random, reflexive, or instinctive. *Random movements* are common in infants and they seem to depend neither upon will nor on any sensory stimulus. Among these might be noticed the stretching of the limbs of a young

baby. Older children also indulge in these movements during sleep. *Reflex movements* arise in response to sensory stimuli and are present at birth. Swallowing, sneezing, and even the first cry at birth may be taken as examples of this class of movements. *Instinctive movements* also arise from sensory stimuli, but are more complex. They may not all be instinctive, though some are. Seizing, raising the head, and creeping may be taken as examples of this type of movement. Seizing is possible at birth, and with great force, but an infant does not desire nor seize anything at sight, but only on coming into contact with it, until the sixteenth to the eighteenth week. Similarly with the raising of the head. This is impulsively done during the first few weeks, but the will to raise the head to see things shows itself about the second month.

The Will.—From these movements which are independent of will, the C. gradually assumes control over them, and wills to do them.

Play being the natural outlet for a C.'s energy is generally regarded now as being a preparatory exercise for life as it will be. Since the human is highest in the scale of animals, the time given up to play should be a long one, and is. It must, therefore, be seriously regarded when the subject of the C. and his development is under consideration. All this leads to the fact that modern systems of education need revision, and in the light of the special study which is being made of C. life, progress in methods of education is being rapidly made. One need only point to the kindergarten and nursery schools, manual and cookery centres, and the various clinics to see that there is a spreading tendency to view the C. as distinct from the adult in many ways.

Social Services.—Nurseries, infant welfare centres, pre-natal and post-natal clinics have all been considerably developed in recent years. Free milk and midday meals are provided by education authorities. The school medical service has been expanded to include treatment as well as inspection and to cover the system of part-time education up to the age of eighteen. In Britain family allowances of 5s. per week are payable on behalf of each C. of school age in a family, except the first. See CHILD WELFARE AND LABOUR.

Education.—The Education Act of 1944 marks an important step forward in the educational system, which is now recast into three stages, primary, secondary, and further education. Facilities for technical education are being considerably increased. The school-leaving age was raised to fifteen on April 1, 1947; as soon as possible it is to be extended to sixteen. Part-time education is to be compulsory for all up to the age of eighteen. See under CHILDREN ACTS; EDUCATION.

See W. B. Drummond, *The Child: his Nature and Nurture*, 1915; H. Crighton-Miller, *The New Psychology and the Parent*, 1925; S. Isaacs, *Social Development in Young Children*, 1937, and *Intellectual*

Growth in Young Children, 1938; J. Smith and D. Paterson, *Modern Methods of feeding in Infancy*, 1938; C. Bühler, *The Child and his Family*, 1940; T. King, *Mothercraft*, 11th ed., 1943; J. Dalley, *The Gift of a Child*, 1946.

Child Adoption, see ADOPTION.

Child, Sir Francis (1642-1713), Eng. banker. Became a freeman of the Goldsmiths' Company in 1664, and, through his marriage into a family of London goldsmiths named Wheeler, he inherited the Wheeler fortune and goldsmith's business. He was the founder of the banking business of C. & C. In 1698 he was elected lord mayor of London and M.P. (Whig) for Devizes. Subsequently he was elected for a London constituency. In 1702 he became master of the Goldsmiths' Company, and in 1727 president of Christ's Hospital.

Child, Francis James (1825-96), Amer. educationist and writer; b. in Boston, Massachusetts, U.S.A., was educated at Harvard Univ., and became prof. of rhetoric there in 1851. He became prof. of Eng. there in 1870, and remained on the faculty practically up to the time of his death. He made a speciality of studies in Eng. literature, editing a monumental ed. of Spenser. But his supreme achievement was to make himself the world authority on anct. Eng. and Scottish ballads. He pub. his first collection in 1857. Continuing his researches, he gathered together the largest extant collection of MSS. on the subject and embodied the result of his studies in his famous book *The English and Scottish Popular Ballads*, pub. from 1882 to 1898, 'first in 10 parts (1882-98) and then in 5 quarto vols.' His other works include an ed. of *Four Old Plays* (1848); a treatise, *Observations on the Language of Chaucer's 'Canterbury Tales'* (1863).

Child, Harold Hannington (1869-1945), Eng. scholar and historian of literature, b. at Gloucester and educated at Winchester College and Brasenose College, Oxford. Dramatic critic of the *Observer*, 1912-20. His long connection with *The Times* began in 1902 when he became a contributor to *The Times Literary Supplement*. He was an excellent scholar in Eng. literature. To the *Cambridge History of English Literature* he contributed more than any other single writer except George Saintsbury; while for the *Cambridge Modern History* he wrote on Milton and his age, and he also contributed to the *Dictionary of National Biography*. An authority on Shakespeare he supplied the stage hist. of each play for the *New Cambridge Shakespeare*. His *Thomas Hardy* (1916) is considered by some to be the best monograph on that writer. Also wrote *Phil of the Heath* (1899), a novel; *The Yellow Rock* (1939), poems; and the libretto of Vaughan Williams's opera, *Hugh the Drover*.

Childebert I., king of the Franks (511-558), son of Clovis, inherited the kingdom of Paris; defeated Amalric II., king of the Visigoths, at Narbonne in 531, and Sigismund, king of Burgundy, in 532.

Childebert II. (570-95), king of Austrasia

575-96; son of Sigbert and Brunhild. In 593 he inherited Orleans and Burgundy from his uncle Gontran.

Childebert III. (b. 683), nominal king of Franks, 694-711; succeeded his father, Clovis III., but had no real power, the kingdom being in the hands of Pépin le Gros, mayor of the palace.

Childeric I., king of the Merovingian Franks, c. 457-81; succeeded his father, Mérovée, and left the throne to his son, Clovis I.

Childeric II., king of Austrasia from 656, and of Neustria and Burgundy from 669; succeeded his father, Clovis II., and left the throne to his brother, Thierri.

Childeric III., last of the Merovingian kings of France, 743-51; deposed by Pépin le Bref, and d. at St. Omer in 754.

Childermas, festival of Holy Innocents, held on Dec. 28, to commemorate the slaughter of the children by Herod.

Childers, Hugh Culling Eardley (1827-1896). Brit. statesman, b. in London. After he left Cambridge Univ. he went to Australia, settled in Victoria, and became an inspector of schools. In 1855 he was a member of the first Victorian Cabinet as commissioner of customs and trades. He helped considerably in the foundation of Melbourne Univ. In 1857 he returned to England as agent-general for the colony. In 1860 he was returned as Liberal member for Pontefract. In 1861 he was made a civil lord of the Admiralty, and first lord of the Admiralty in 1868, and a member of Gladstone's first Cabinet. In 1880 he was in Gladstone's second administration as secretary for war, and as such was responsible for the military operations in the first Boer war in 1880, and the Egyptian expedition of 1882. At the end of 1882 he succeeded Gladstone as chancellor of the Exchequer; his proposals for a conversion of consols were not carried out, and the defeat of his budget of 1885 led to the downfall of the ministry, though the real cause was the national dissatisfaction with the delays and mismanagement which had ended in the death of Gen. Gordon. At the following general election he lost his seat, but was returned as a Home Ruler for S. Edinburgh in 1886, and joined Gladstone's third ministry as home secretary. He objected to certain of the financial clauses of the first Home Rule Bill, which were withdrawn. He retired from Parliament in 1892. See S. Childers (his son), *Life and Correspondence of the Rt. Hon. H. C. E. Childers*, 1901.

Childers, Robert Cæsar (1838-76), Oriental scholar, educated at Wadham College, Oxford; in 1860 entered the Ceylon civil service, acting as secretary to the governor, Sir Charles McCarthy; returned to England in 1864, and in 1872 became sub-librarian at the India Office, London. In 1873 he became prof. of Buddhist and Pali literature in Univ. College, London. His numerous valuable works on oriental subjects include Pali text, with trans., of *Khuddaka Patha*, and his great *Pali Dictionary* (1872-75).

Childers, Robert Erskine (1870-1923), author and rebel, son of Robert Cæsar

C. Educated at Haileybury and Trinity College, Cambridge. Junior clerk in the House of Commons, 1895-1910. Wrote an enthralling story of Ger. preparation for war, *The Riddle of the Sands* (1903), also vol. v. of *'The Times' History of the War in S. Africa* (where he had fought) (1907). Major in air force during the First World War. Republican opposed to Irish Free State, his interest in Ireland being derived from his mother—a Barton of Glendalough, co. Wicklow; where, after acts of rebellion against the new Free State, he was captured, Nov. 10, 1922. Executed at Beggars' Bush Barracks, Nov. 24.

Child-killing, see INFANTICIDE.

Children Acts, 1908, 1933. The 1908 Act, which is popularly known as the Children's Charter, was introduced into the House of Commons in Feb. 1908 by Sir Herbert (later Viscount) Samuel, then under-secretary for the Home Office, who described it as a Bill to consolidate and amend the law relating to the protection of children and young persons, reformatory and industrial schools, and juvenile offenders, and otherwise to amend the law with respect to children and young persons. The Act of 1908, or prin. Act, is in fact a codifying measure designed partly to remove the confusion and doubt consequent on the existence of a number of more or less unrelated statutes and partly to strengthen the law in a number of different directions. It was subsequently much amended by the Children and Young Persons Act, 1932 (later fused in the codifying Act of 1933), which, *inter alia*, repeals and re-enacts the provisions of reformatories and industrial schools, and strengthens the provisions on juvenile courts and offenders. That the Act was wanted was clearly indicated by the under-secretary's statements in the first reading to the effect that the Infant Life Protection Act, 1897, passed to stop the evils of baby-farming, was in many respects ineffective. The prin. Act contains valuable and necessary provisions designed to obviate the evils arising from the contaminating influences of adult offenders over children and young persons. The first part of the Act (as amended) is directed to the protection of infant life, and secures more satisfactory treatment for children placed out to nurse or adopted by foster-parents. It provides that where a person undertakes for reward to nurse and maintain an infant under the age of nine years apart from its parents or having no parents, he must give written notice of his undertaking to the local authority within a specified time which varies according to circumstances. The local authority may fix the maximum number of infants under the age of nine years who may be so maintained in any particular dwelling. If an infant dies or is removed from the foster-parents, the latter must notify the authority and the dist. coroner to that effect. For the more effective carrying out of these provisions the Act enables the poor law authority to appoint infant protection visitors, who shall have power to apply for an order of removal of

an infant kept in insanitary premises or by persons who by reason of drunkenness, immorality, or other similar cause are unfit to have charge of an infant. Offences under this part of the Act are punishable with imprisonment for a term not exceeding six months or to a fine not exceeding £25. These provisions do not extend to hospitals, convalescent homes, or institutions maintained by a gov. dept., or local or other authority constituted by Act or Charter, nor to an institution approved by the board of control. There are also analogous provisions in the Act of 1933 respecting voluntary homes for boarding, care, and maintenance of poor children or young persons (i.e. persons who have reached the age of fourteen years but who are under seventeen years). Part II. of the prin. Act (as amended) is directed to the prevention of cruelty to children and young persons, re-enacting the pre-existing law as to the punishment of cruelty, expanding the legal conception of cruelty, and strengthening the law in regard to the employment of children in begging. Besides the more obvious forms of cruelty like beating and abandonment, cruelty under the Act comprises: Exposure of children under seven to the risk of burning through not taking reasonable precautions against danger from open fire grates; allowing children and young persons to be in brothels; the death of an infant under three years of age through overlaying or suffocation caused whilst the infant was in bed with some other person under the influence of drink; the failure on the part of a parent or other person legally liable to maintain a child or young person either (i.) to provide adequate food, clothing, medical aid, or lodging, or (ii.) to take steps to procure the same to be provided under the poor law; and encouraging the seduction or prostitution of a girl under the age of sixteen. Conviction or indictment entails either a fine not exceeding £100 and, in addition or in the alternative, imprisonment for any term not exceeding two years with or without hard labour. Part III., which deals with juvenile smoking, makes it an offence to sell to a person apparently under the age of sixteen any cigarettes or cigarette papers, whether for his own use or not. It is also an offence for a tobacconist to sell tobacco other than cigarettes to such a person if the tobacconist has reason to believe that it is for the use of the young person. Fines are imposed varying from £5 to £10 according to the number of convictions. Constables and park-keepers are authorised by the Act to search boys under sixteen seen smoking in any public place for cigarettes or cigarette papers. The case of automatic machines is also dealt with by a provision empowering a magistrate to order the removal of any machine for the sale of cigarettes believed to be extensively used by children or young persons. Part IV. of the Act consolidated and amended the various acts relating to reformatory and industrial schools, but is now replaced by provisions in the 1933 Act as to

orders committing juveniles to 'approved schools.' This part of the 1933 Act is the corollary to the initial clauses of the Act which codify the law on juvenile courts and the procedure to be observed in such courts (see JUVENILE OFFENDERS). Provisions respecting approved schools, i.e. schools which have received certificates of approval from the Home Office, are to be found in the Act of 1933. Part V. of the prin. Act and Part II. of the Act of 1933 relate to juvenile offenders, and empower any court to remit such offenders to a juvenile court. The Act of 1933 raises the age of criminal responsibility to eight, the presumption that no child under that age can be guilty of any offence being conclusive (see also under JUVENILE OFFENDERS). Part VI. of the Act contains miscellaneous provisions, the prin. relating to the powers of the education authority to secure the cleansing of verminous children, schooling of vagrant children, prevention of the sale of intoxicants to children under five, and the duty of those who provide entertainment to make certain arrangements for the safety of children. The Act of 1933 contains provisions restricting the employment of children. No child under twelve years of age may be employed at all, save as to authorised employment by parents or guardians in light agric. or horticult. work. Also, no child under fourteen years of age may be employed before the close of school hours, nor before 6 a.m. or after 8 p.m., nor for more than 2 hrs., nor in lifting or moving anything so heavy as to be likely to cause injury. The local authorities may make by-laws on the employment of children, distinguishing between children of different ages and sexes and different localities, trades, occupations, and circumstances. There are saving clauses as to children taking part in entertainments under the provisions of licences. The Act of 1933 also contains provisions against juveniles taking part in or being trained for dangerous performances. See also CHILD WELFARE AND LABOUR.

Children, Adoption of, see ADOPTION.

Children, Employment of, see preceding article and under CHILD WELFARE AND LABOUR.

Children, Societies for Prevention of Cruelty to. The principal of these societies, which was incorporated under royal charter in 1895, is associated with the name of Benjamin Waugh, by whose exertions the London S.P.C.C. was estab. in 1884. Its object was to discover cases of ill-treated and neglected children, and to institute proceedings against offenders; and, further to secure the passing of laws for the purpose of obtaining a greater measure of protection for children. The agitation of these societies resulted in the passing of the Criminal Law Amendment Act, 1865, and the Prevention of Cruelty to Children Act, 1889. These Acts and the Children Acts, 1908, 1933 (q.v.), are a clear indication of the public recognition of existing evils, and their presence on the statute book to a large extent destroys the *raison d'être* of these societies.

Nevertheless there is unfortunately still considerable scope for their activities in supplementing the work of local governing bodies and the police, especially in the direction of removing children from the influence of drunken parents. In this latter respect the London S.P.C.C. state that practically all the cases of cruelty investigated by them have their origin in drink. Because the number of prosecutions brought into court by the S.P.C.C. is not great, there may be a tendency to overlook the magnitude of the work of the society. For instance, according to the report of the society for the year 1937 no fewer than 120,000 children in England, Wales, and Ireland, and 26,000 in Scotland were found to be suffering in some form or other, either through culpable neglect or actual malicious ill-treatment—generally by parents and guardians—necessitating intervention. Some 56,000 individual cases of maltreatment of young people came under the notice of the police or of the inspectors of societies, and there were over 1000 convictions. The address of the N.S.P.C.C. is 15 Leicester Square, London, W.C.2.

Children's Aid Society.—This society acts in collaboration with the Reformatory and Refuge Union to rescue destitute and neglected children, and those exposed to dangerous moral environment. Its officials are employed in enforcing the provisions of the Children Acts, 1908, 1933. At their instance, numerous children are placed by magistrates' orders in industrial schools.

Childrenite, rare mineral consisting of aluminium iron phosphate. It occurs in orthorhombic crystals, with hardness 4.5 and sp. gr. 3.2. It has been found in a few places in Cornwall and Devon. An allied species containing manganese is known as cosmorite, and occurs in Connecticut.

Childress, city of C. co., Texas, U.S.A. Pop. 7000.

Childs, George William (1829-94), Amer. publisher and philanthropist, b. in Baltimore. In 1842 entered U.S.A. navy; became a book-store clerk in Philadelphia, 1843; set up as an independent publisher, 1847; became a partner in the firm of C. & Peterson, 1849. In 1864 he took over the *Philadelphia Public Ledger*. He wrote *Recollections of General Grant* (1885) and *Personal Recollections* (1890). His charitable work was very large, and he is perhaps best known by his erection of public memorials to great men, including Herbert, Cowper, Leigh Hunt, Moore, Shakespeare, Milton, Ken, and Andrews in England, and Edgar Allan Poe and Richard Proctor in America.

Child Study includes now the anatomy, physiology, anthropometry, and psychology of the child as a child. Rousseau was the first to recognise the fact that a knowledge of children and their ways is essential to any one who wishes to reach them. Darwin was one of the first in England to publish observations of the development of a child, and since then the study has been carried out with great zest

both here, on the Continent, and in America. Two methods are adopted in C. S.: (1) the *individual* method which consists in as full a study as possible of a single child; and (2) the *collective* method, whereby sev. children are examined and studied for particular things, and an average or standard drawn up. Many of the results gained have been summarised under CHIL.D. It has been found possible to calculate the effects of the various lessons in the way of producing bodily and mental fatigue. School children in the same manner are medically inspected, and the results tabulated and conclusions drawn. The importance of all this cannot be overemphasised. As a direct result of C. S., kindergartens, and infant schools run on kindergarten lines, are now the only type of school for very young children. Play has been pressed into the service of the teacher, and freer and less-cramped movements are used from the beginning. "Cramming" is recognised as being extremely harmful, and the deaf, the blind, and the mentally deficient are being trained in a scientific manner. A third, though not very practicable, method of C. S., is that which is given when spontaneous writings of children can be obtained. But, as the child is usually writing under the knowledge that his work is to be seen, it is very rarely of use. In studying children by the individual method, the child should be watched, much as a naturalist might watch an animal or insect, at work and at play, asleep and awake; but he should not be allowed to know he is being watched. This has been done in America by observation through glass panels, the child being unaware of the fact. Questions should be asked him, but he must not know that he is being questioned for a purpose, or he will probably become self-conscious and his replies studied. One great difficulty experienced by the child-studier is the finding of the correct motive for many of the child's actions; this is a matter of great importance, for it is only by discovering the motive that the right way in which to correct or encourage the child can be found. Sev. societies are in existence for the study of the child, chief among which are: Brit. Child Study Association, who publish three times a year a magazine called the *Paidologist*; the National Froebel Union; and the Parents' National Education Union. For list of books on this subject, see CHIL.D. EDUCATION, and the following. See J. M. Baldwin, *Mental Development in the Child and the Race*, 1895; E. A. Kirkpatrick, *Fundamentals of Child Study*, 1923; M. Lowenfeld, *Play in Childhood*, 1935; M. Montessori, *The Secret of Childhood*, 1936; A. Gessell, *The First Five Years of Life*, 1941; C. W. Valentine, *The Psychology of Early Childhood*, 1942; H. Edleston, *Separation Anxiety in Young Children*, 1943; S. Isaacs, *Troubles of Children and Parents*, 1948. See also bibliographies under CHIL.D. EDUCATION.

Child Welfare and Labour. The movement to protect children and young people from the evils that beset them in the

modern commercialised and urbanised communities received a great impetus in the first and second decades of the twentieth century. The First World War served to accelerate this humanitarian movement, which is now universal throughout the civilised world, the *impetus* of the League of Nations being given to it in 1924 when the Assembly agreed to take C. W. and L. within its purview. Many agencies, governmental and voluntary, now cover the whole period of childhood, but the chief divs. of this welfare work may be said to be as follows:

- (1) The care of infants and nursing mothers; in the United Kingdom falling to the lot of the Ministry of Health.
- (2) The care of school children from five or six years to fourteen years of age (shortly to fifteen years if proposed legislation is passed), which is primarily the concern of the Ministry of Education in Great Britain.
- (3) The protection and prohibition of juvenile labour; which is the function of the Ministry of Labour in Great Britain.
- (4) The segregation of juvenile delinquents from adult criminals in courts and reformatories.
- (5) The prevention of contaminatory influences on the character of children due to poverty and criminal associates. As all these categories except that relating to juvenile labour are included in the Children Act, 1908, and as this Act was the starting-point for much similar legislation in the Brit. dominions and other countries, its provisions should be noticed.

This Act was supplemented in 1918 by the Education Act of that year, which further extended the tendency of the education authorities to concern themselves in all that relates to child welfare. Apart from its purely educational clauses this Act provides for the care of physically and mentally defective scholars, for feeding them in necessitous cases, and for medical inspection and treatment in the schools. The Board of Education may even make grants to such societies as supplement its care of children, as, for instance, those which organise play centres.

The National Health Service Act, passed in 1946, is, together with the Education and Family Allowances Acts, which were also passed soon after the Second World War, designed to remove most of the obstacles which had theretofore impeded the development of a positive national policy for the promotion of child health. The Act removes most of the important financial and administrative barriers to the efficiency of the services, and it establishes machinery for the development of better services, but the policy which the machinery is to operate remains largely undetermined. The report of the Royal College of Physicians on the child health services to be estab. under the Act suggest some of the more important changes needed: hospital physicians should give some of their time to preventive work in clinics, nurseries, and schools; post-graduate instruction in child health needs to be improved and given a new orientation; and both for this purpose, for the promotion of research, and

for the dissemination of knowledge throughout the children's services, the services of each region should be able to look for guidance and inspiration to a univ. institute of child health. In recent years the growth of academic interest has been reflected in the estab. of univ. chairs in child health at Durham, Liverpool, Birmingham, Leeds, and Sheffield, while the estab. of institutes has also made progress. The college holds, and rightly, that there will always be need of an expert in child health with a preventive bias intermediate between the home doctor and the hospital doctor. See E. Fuller (ed.), *The International Handbook of Child Care and Protection*, 1928.

The influence on other countries of the Brit. Act of 1908 has already been referred to. Thus Belgium in 1912 enacted the law for the protection of infancy, and in the same year in U.S.A. a special dept. of State was estab. at Washington to deal with C. W. The estab. of this Federal Children's Bureau was followed by the founding of many C. W. institutes throughout the States. In 1913 the Belgian Gov. convened in Brussels the first International Congress for the Promotion of C. W. The First World War prevented the carrying out of the proposal of this congress for the estab. of an international C. W. association, but a second congress, also held in Brussels, in 1921 achieved this object. It was the action of the assembly of the League of Nations which crowned the effort for organising this work on an international footing. The fifth assembly on Sept. 26, 1924, undertook the promotion of international C. W., and subsequently the C. W. Committee of the League was estab., the first ann. meeting of the committee taking place in March 1926. In this connection, the Declaration of Geneva, pub. in 1923, setting forth in general language, the duty of humanity to childhood, was recommended by the League as a guide to the underlying ideals which should govern C. W. work. With regard to child labour the movement for restriction goes back to the beginning of the industrialisation of Great Britain, the earliest legislation on juvenile employment being passed in 1802. As to employment of children generally see under CHILDREN ACTS, 1908, 1933. Throughout the Brit. empire similar legislation restricts the employment of, at any rate white, children under the age of fourteen. In the U.S.A. the first Federal child labour law came into operation in Sept. 1917. The League of Nations International Labour Office naturally concerned itself in the matter of child labour and the general tendency in all civilised states now is to fix fourteen years as the earliest time at which a child can be employed in gainful work.

United States of America. The prevailing sentiment in the U.S.A. towards C. W. is reflected in the legislative enactments which have been passed in recent years by the different states to control child labour. In every state no child under fourteen years of age may be employed in industry, and in most states

no child may be employed on night work. Again, in most states, a child's hours are limited to a forty-eight-hour week, though in a few states forty-four hours are the maximum. As in Great Britain, so in the U.S.A., compulsory attendance at an elementary school is required until entrance into industry or until a minimum age is reached, and the full elementary course must be taken. In rather over one half of the states a child under sixteen years of age must have attained at least the sixth grade before being employed in an industry. Naturally, where there are so many state's Legislatures and varying conditions of social existence, the laws governing school attendance are by no means uniform: in the dist. of Columbia, which enjoys perhaps the most advanced child labour code in the country, the amended child labour law of 1908 provides that the director of the dept. of school attendance shall be the authority for the distribution of work permits to all children under eighteen years of age. Such permits are only to be granted on receipt from the prospective employer of evidence as to the character of the work, the age of the prospective employee and, if under sixteen, of physical fitness, and also a school certificate recording ability to read and write Eng. and the attainment of a prescribed grade. Attendance in continuation schools is now fixed by the Columbia dist. legislature at the age of seventeen. In recent years there has been a marked tendency in many states to raise the educational requirements for work permits. Again, the S. Carolina legislature has recently made attendance at school compulsory between the ages of seven and fourteen; in Virginia, in 1928, the period of attendance was raised to the ages of seven to fifteen, and the administrative machinery for securing observance was strengthened. In a large number of states penalties of varying severity are enacted against employers who contravene the child labour laws. In the dist. of Columbia, penalties of fines and imprisonment are prescribed for parents and guardians, as well as for employers; inspectors are appointed to secure the enforcement of the law and jurisdiction to that end is vested in special juvenile courts. Similarly, in Virginia, for example, there are juvenile and 'domestic relations' courts estab. for the purposes of the child labour laws. In some states illegal employment of minors, either by reason of age or the hazardous nature of the industry, is punished by levying double or even treble compensation, in the event of injury, on the employer, but in others only ordinary workmen's compensation rates are awarded.

Mothers' Assistance Acts are a feature of C. W. In a large number of states. Over two-thirds of the states now provide for such assistance, though at very different rates. The lead in this particular social reform was taken many years ago by France and Australia, and a scale of mothers' allowances has now for some time been in operation in Canada. In the U.S.A. co. funds are appropriated in

most states, for mothers' aids grants. In some S. states voluntary agencies supervise the welfare of children, either in their own homes or in institutions set up by the agencies. In New York city over \$5,000,000 is spent annually on this form of family endowment. The amount of financial assistance in the U.S.A. ranges from about \$1000 a year for a mother with three dependent children to about \$500, not all the states being in a position to subsidise an equally high standard of living.

Chile, or Chili, republic extending along the W. coast of S. America, to the S. of Bolivia, between the Pacific and the Andes; it includes also the greater part of the Fuegian Archipelago. Its existence as a republic may be said to date from 1810, when it declared its independence of the mother country, Spain, though the colonial authority was not finally broken till the battle of Chacabuco in 1817. In 1880 C. annexed Atacama and Tarapaca, including the Lobos Is., and occupied the prov. of Tacna. Four years later Tarapaca and Tacna-Arica were formally ceded to C. by Peru, the latter prov. for ten years only, after which period a plebiscite of the prov. was to be taken to decide to which country it should belong. This was never done, C. remaining in possession. For seventeen years diplomatic relations between the two countries were severed, but in July 1928 they were resumed, and before a year had passed the dispute was settled, Tacna going to Peru, Arica remaining with C. The physical features of C. are very accurately known, as a gov. survey of an exhaustive nature was begun in 1848, and carried on for many years. Since the E. boundary of C. is, broadly speaking, the main chain of the Andes, the W. section, though in fact considerably elevated in some places, is everywhere low compared to the E. portion. The portion of the Andes between 31°40' and 34° 20' S. lat. is the highest, the average height being about 16,000 ft. The two highest peaks of the Andes are Aconcagua (23,393 ft.) in 32° 39' S., and Cerro de Mercedaria (22,300 ft.) in 32° S.; other noteworthy mts. are Polleras (20,266 ft.), Tolorsa (20,140 ft.), Juncal (19,360 ft.), and Chimbote (18,645 ft.). The height of the Andes gradually diminishes from about 34° 20' S. There are a number of passes over the Andes connecting C. with the Argentine Republic, of which the best known are Bermejo (13,025 ft.), and Iglesia (13,412 ft.), on the Uspallata road; Pircas at a height of 16,962 ft.; and Valle Hermoso, 11,736 ft. There is a great difference in the breadth of the higher and lower sections of C. at different places. The land above 5000 ft. extends in some places to within 10 m. of the coast: whilst in others, notably along the chief rivs., the land under 5000 ft. extends for a distance of over 70 m. inland. In the N. the Chilean portion of the desert of Atacama lies between the coast and the mts., but to the S. of the desert there are few spaces under 1500 ft. To the S. of 35°, however, a

region which rarely reaches this height extends from the coast for an average distance of 60 m. The general formation of this region is as follows: the highest part is nearest to the sea, and, rising abruptly from the coast, sinks eastward in terraces to an interior valley, or plain. This interior plain slopes gradually from N. to S. The Andes of C. are highly volcanic in character, and earthquakes frequently occur, the average number of shocks, of varying seriousness, felt at Coquimbo being about forty every year. Perhaps the most destructive earthquake recorded in C. was that of 1751, when the former tn. of Concepción was sunk in the

at its mouth; and the deep Maullín, which drains Lake Llanquihue. Owing to the heavy rainfall of the S., many large lakes are there found, notably those of Llanquihue, Chapo, Ranco, and Lago de Todos los Santos, otherwise known as Lake Esmeralda. On account of the conformation of C., extending from 18° to 56° S. lat., the climatic conditions vary considerably though extremes of heat are seldom observed owing to the influence of the cold Humboldt current. The place in which the greatest extremes are observed is the desert of Atacama; there the temp. varies frequently from 100° in the daytime to 36° at night. On the coast



F.N.A.

THE COASTAL PLAIN OF CHILE, BETWEEN VALPARAISO AND SANTIAGO

sea, and the majority of places lying between 34° and 10° S. were destroyed; on Nov. 19, 1822, the coast near Valparaíso was permanently raised 4 ft. over 100,000 sq. m., and Valparaíso, Tuillota, Casablanca, and Limachi, were destroyed; on Feb. 20, 1835, the rebuilt Concepción was again destroyed, together with Talcahuano; in 1868 Arequipa and Iquique were ruined, whilst in 1875 Iquique was again levelled with the ground. The rivers of C. all flow from E. to W. across the country; even those flowing across the longitudinal interior valley mentioned above do so, which is a proof that the valley received its present slope after the rivers came into being. In consequence of their direction, the rivers are not of great length, and therefore of no great importance as means of transport. The most important are the quick-flowing Mapu; the Maule, which is navigable for a longer distance than any other; the Biobío, the largest of all, but not navigable for large vessels in its lower course; the Callecañe, which is the most important for navigation, as it has a good harbour

the temp. rarely reaches a greater height than 90°. The mean ann. temp. of Valparaíso is about 59°, that of Santiago 55°, and that of Valdivia 53°. In the longitudinal valley there is a mild uniform climate, the Humboldt current and cool winds from the Andes serving to mitigate the heat in summer, whilst in winter the overcast skies and the winds from warmer lands serve to prevent excessive refrigeration. The rainfall is very low on the N. coast, but in the fjord region of the S. it is much heavier. At Valparaíso the mean ann. rainfall is about 15 in., whilst at Ancud, in Chiloe, it is 130 in. The Chilean part of the desert of Atacama is as destitute of vegetation as the maritime region of Bolivia, and down to lat. 30° S. the coast has no vegetation, though inland some is found at about that lat. The vegetation of C., which is in full vigour about the lat. of Valparaíso, is remarkable for the large number of peculiar forms which belong to it. A very striking feature of the vegetation of C. is the small number of deciduous trees, when the high lat.

of the region is considered. Among the more notable of the Chilean trees are the *Quillata saponaria*, or soap-tree, the bark of which is lined internally with a whitish saponaceous substance; the *Jubaea spectabilis*, a palm allied to the coco-nut, and yielding a sweet sap known as palm-honey; the *Fagus obliqua*, an excellent timber tree; the *Fitzroya patagonica*, another very good and very numerous timber tree; and the *Eucryphia condifolia*, a foliage tree which grows to a great height and blossoms most luxuriantly in Feb. The apple-tree has been introduced with great success, and bamboos extend for a long way S., being used as fodder for cattle. Numerous twining and climbing plants are found, giving something of a tropical aspect to Chilean vegetation; such are the *Mutisia*, an asteraceous plant with blue flowers, the beautiful red *Tropaeolum speciosum*, and the gorgeous *Philisia buxifolia*, which has flowers shaped like a bell and of the colour of fire. The region between Valparaíso and Valdivia which has sometimes been termed the garden of the New World, is the prin. centre of agriculture, though in other dists. great strides have been made in this science in recent years. Wheat is the prin. crop, but maize, oats, hemp, barley, beans, lentils, peas, and potatoes are also grown. All European fruit-trees flourish, and a large quantity of fruit is annually sent to U.S.A. The vine is grown, and excellent wine is made—94,000,000 gallons in 1937, of which 3,500,000 were exported, chiefly to Belgium and Germany. Tobacco and the sugar cane are also cultivated. Pastures N. of the R. Maule feed immense herds of cattle; the hogs of the is. of Chiloé have given it a reputation for hams; and in addition quantities of horses and goats are reared. Dairy farming is increasing in importance, and in the S., in Patagonia and Tierra del Fuego, are extensive sheep-farms.

Chilean fauna is not very remarkable for variety; pumas are the chief wild animal, and are very destructive of cattle. The chief of the other animals are the pudu, a small variety of deer, the coypu, or native beaver, the chinchilla, guanacos, and vicuñas in the int. dists., and a variety of fish-otter. Many varieties of birds are found, among which may be mentioned ibises, parrots, flamingoes, herons, numerous species of small song-birds, and the Chilean swan, which has a pure white body and a black head and neck.

By far the most important mineral found in C. is nitrate of soda (or *salitre*), which is recovered from the desert of Atacama. For many years C. has been the only country to produce this mineral, which is therefore a very valuable source of revenue. The production figure was 3,162,800 tons in 1928, about 2,800,000 tons being exported. In 1937-38 only 1,544,000 tons were exported, and in 1941 1,270,000 tons (but in some years the production figure has not been pub.). In 1930 a law was passed constituting a national nitrate company (Cosach) with

a capital of \$75,000,000 with State participation, to take over the whole nitrate industry, but in 1934 a new company was formed, the Nitrate Company of Tarapacá and Antofagasta, consisting of over thirty companies comprised in Cosach, the Anglo-Chilean Nitrate Corporation and the Lautaro Nitrate Company. All these together constitute the present organisation of the industry. The sales of these companies are effected through a central body called the Nitrate and Iodine Sales Corporation. The next mineral in importance is copper, of which there is a great abundance, the Tamaya mine, in the prov. of Coquimbo, being regarded as inexhaustible. C. is the world's second largest producer of this metal, and provides not far short of one-fifth of the total ann. supply (nearly 500,000 metric tons in 1943). Silver is also found in fairly large quantities, the centre of the industry being Copiapo; a large number of mines yielding both gold and silver are in operation in Tarapacá, Guanaco, and Cachinal in Atacama, and Caracoles in Antofagasta. Another mineral of importance is lignite coal, of which the prin. beds lie to the S. of the Miblo to about 37° S. lat.; about 2,000,000 metric tons are mined annually. Deposits of iron ore in Coquimbo and Atacama yield annually between 1,000,000 and 2,000,000 tons. Many other minerals are found in smaller quantities, including manganese ore, sulphur, cobalt, zinc, antimony, tin, and salt. The number of manufactories in C. is rapidly increasing; and in the last census there were some 300,000 employees in manufacturing establs. They include smelting works, breweries and distilleries, flour and saw mills, textile factories, tanneries, sugar refineries, and works for the manuf. of foodstuffs, starch, soap, paints, furniture, boots and shoes, glass-ware, biscuits, hosiery, hats, candles, matches, brushes, cordage, baskets, pottery, and cigarettes. The Chilean people are of Sp. language and physique, though there is a not inconsiderable admixture of native Indian blood. At the time of the Sp. conquest in the sixteenth century, a native race calling themselves Moluche (warriors) occupied the greater part of the present republic of C. The Spaniards called this race Araucanians, and when they conquered the Incas they left the former in possession of a state of their own, to which was given the name of Araucania. A portion of this area, along the slopes of the Andes from Copiapo to Chiloé, is still inhabited by them. Other tribes worthy of mention are the Changos in the N., an Aymara tribe; the Aícaluf in the channels lying to the N. of the strait of Magellan; the Onas and the Yagans in Tierra del Fuego; and the Tehuelches, inhabiting part of the mainland of Patagonia. There is a considerable foreign element in C., chiefly Gers. in the extreme S., natives of the Argentine Republic in the N., and Fr., Eng., and N. Amers. in the middle prov. The total trade of C. in 1937 was \$34,411,000, but in 1943 only \$16,200,000 (exports, \$10,722,000; imports, \$23,689,000). The

mineral exports are by far the most considerable, and include nitrate and copper, and silver ores in large quantities, together with gold, guano, coal, iodine, borax, and manganese; wine, wool, cereals, vegetables, and fruit are among other goods exported. Exports of fresh bird guano are prohibited, but exports of fossilized guano, which began in 1934, are a valuable industry.

The chief imports of C. are machinery, oils, combustibles, textile goods, tools, and electrical equipment; most of the trade is done with Great Britain and the U.S.A., the latter being the chief importer. The prin. ports for exports are Iquique, Pisagua, and Antofagasta; Coquimbo, Valparaíso, Valdivia, and Punta Arenas. Valparaíso is by far the most important port for imports, two-thirds of the total entering there, whilst Iquique and Talcahuano come next in importance. There are 5444 m. of railway, both State and privately owned (State-owned, 3629 m.; Brit.-owned, 1815 m.), linking up the ports with the industrial centres; the railway from Valparaíso to Buenos Aires crosses the Andes at Uspallata (9843 ft.), by a tunnel having a length of over 6 m.; two other lines cross the Andes to Bolivia. A convention between C. and Argentina, signed in 1922, arranges for the construction of two more trans-Andine lines. C.'s main railway line, the Longitudinal Railway, runs from N. to S. with branches connecting with the ports. The Chilean trans-Andine line is now part of the State railway system. Aviation is highly developed between interior points and abroad. A plant for manufacturing aeroplanes was first estab. in 1930. There are six civilian and two gov. airports. There are telegraph and telephone lines, and a chain of wireless stations extends along the coast. The republic of C. is the best regulated of the republics of S. America; as an independent state it has attained a higher degree of prosperity than any of the others, notwithstanding the fact that it was one of the least important Sp. colonies in the New World. The constitution of C. dates from 1925, when that of 1833 was superseded. The president of the republic is elected by direct popular vote, his term of office is for six years. The finances of the country are in a satisfactory condition on the whole. Legislative power is in the hands of the National Congress, which consists of a Senate of forty-five members, and a Chamber of Deputies of 143 members. All voting is by ballot, and there is a universal suffrage for registered citizens over twenty-one years of age who can read and write. Until its disestablishment in 1925, the Rom. Catholic was the State Church; it is still the chief religion; there is an archbishop of Santiago, ten bishops, and four vicars apostolic. Full religious toleration has been estab. since 1865. The condition of education in the republic has been improved of late years; it is now free and compulsory for all children between the ages of seven and fifteen. There is a univ. at Santiago,

technical and secondary schools, and 4760 public and private primary schools. There are, besides, professional and agric. schools, and schools of mines. There is a national library containing about 300,000 vols. Since 1900 military service has been compulsory, and conscription obtains in both the army and the navy. Area of the republic 285,100 sq. m.; pop. (1940 census) 5,023,539; (estimated for 1947) 5,347,899. Pop. of Santiago (the cap.), 1,002,000. Other cities and tns.: Valparaíso (260,000); Concepción (86,000); Temuco (85,000); Viña del Mar (80,000); Chillan (62,000); Talca (57,000); Antofagasta (52,000); Valdivia (49,000); Talcahuano (42,000); Iquique (39,000); Magallanes (formerly Punta Arenas) (34,000). See R. P. Diego de Rosales, *Historia General del Reyno de Chile* (Valparaíso), 1877-78; A. U. Hancock, *History of Chile*, 1893; W. E. Parker, *Chileans of To-day*, 1920; W. E. Browning, *Chile*, 1930; A. Edwards, *The Dawn*, 1931; M. C. McBride, *Chile: Land and Society*, 1936; H. Mielche, *Land of the Condor*, 1947; also V. Figueroa, *Historical, Biographical and Bibliographical Dictionary of Chile* (5 vols.) (Santiago), 1931.

Chilecito, tn. of the Argentine Republic in the prov. of and 40 m. N.W. of the cap. of La Rioja in the Famatina valley. Mining is the chief industry, gold, silver, and copper being worked. Wines are also distilled. The tn. is connected with Córdoba by rail. Pop. 9300.

Chili, Chihli, or Pechili, prov. of China, see HIOPEI.

Chiliad (Gk. $\chi\lambda\iota\alpha$, a thousand), group of a thousand things; the numbers of one multiple of a thousand to the next; also a period of a thousand years.

Chilian, St., see KILIAN.

Chilianwala, or Chillianwalla, vil. in the W. Punjab, Pakistan, 30 m. N.W. of Gujrat. It was the scene of a battle between the Brit. and the Sikhs on Jan. 13, 1849.

Chilina, or Chilean Snail, genus of gastropod molluscs representing the family Chiliniidae. The species are fresh-water pulmonates with larger pulmonary apertures than are to be found in any others of their sub-order, and their visceral commissure is unusually long. They inhabit Chile, S. Brazil, and Patagonia.

Chilka, lagoon in S.W. Bengal, India, cut off from the bay of Bengal by a sandy ridge. Its usual area is about 350 sq. m. and its depth only about 6 ft., but at the height of the rains its depth and extent considerably increase. It contains some inhabited is., and the vils. on the coast are engaged in the salt-working industry.

Chilkoot Pass, pass about 28 m. long, over the Rocky Mts. in Alaska, U.S.A. This pass, on the route of an anc. Indian trail, was at one time one of the chief means of reaching the Yukon gold-fields from the coast of Alaska. Thirteen miles from its starting-point, at Dyea, it reaches a height of 3500 ft.; it terminates at Lindeman, Yukon, Canada.

Chillan, cap. of the prov. of Nuble in Chile, 112 m. by rail E.N.E. of the seaport tn. of Talcahuana. It is a thriving com-

mercial city with trade in cattle, grain, and hand-made lace, situated on the slope of an extinct volcano in the midst of rich agric. country. Pop. 62,000.

Chillicothe, name of two cities of the U.S.A.: 1. City in Missouri, the cap. of Washington co., 90 m. N.E. of Kansas City; largest tn. on the railway between Hannibal and St. Joseph. Trades in coal, limestone, live-stock, wool, and hides. Pop. 8000. 2. Co. seat of Ross co., Ohio; manufs. carriages, paper, iron, leather, farming implements, and machinery. Pop. 20,000.

Chilling, or **Chill Hardening**, the process of cooling metals rapidly, so that the skin becomes hard, leaving the inner portion soft. Molten iron poured into moulds, cools more rapidly at the surface than inside, the consequence being that a hard coating, capable of taking a polish and less liable to rust, surrounds the inner soft portion. Shot are chilled and hardened by being allowed to drop through the air and thence into water. See also **CASE-HARDENING**.

Chillingham, par. township and vil. on the R. Till in N. of Northumberland, 8 m. S.W. from Belford railway station. C. Castle, the seat of the earl of Tankerville, was built in the reign of Edward III.; its park is part of an anct. forest. In the park is preserved a herd of semi-wild cattle. Pop. 190.

Chillingworth, William (1602-44), famous Eng. divine of the seventeenth century, b. at Oxford. Admitted to Trinity College, Oxford, 1618; became M.A., 1623, and appointed fellow of the college, 1628. He became a convert to Rom. Catholicism under the influence of the Jesuit Fisher, and went to the Jesuit College at Douay. His godfather, Dr. Laud, bishop of London, persuaded him to leave the Rom. Church. He quitted Douay and studied the claims of Protestantism, and eventually entered into the fold of the Eng. Church. He had very conscientious scruples, and declined to accept a preferment offered to him by Sir Thomas Coventry, keeper of the great seal, in 1635, because he could not subscribe to all the Thirty-nine Articles, and was opposed to the damatory clauses in the Athanasian creed. He wrote in 1637 *The Religion of Protestants a Safe Way to Salvation*, a famous polemic characterised by clear style and logical reasoning. He finally overcame his scruples and was promoted to the chancellorship of the church of Sarum (1638), and became prebendary of Brixworth in Northamptonshire. A staunch Royalist and believer in the doctrine of divine right of kings, he took an active part in the Civil war, was taken prisoner at Arundel Castle by Sir Wm. Waller, and d. at Chichester.

Chillon, thirteenth-century castle or fortress of Switzerland at the E. extremity of Lake Geneva, canton of Vaud, 2 m. S.E. of Montreux. It stands on an isolated rock connected with the mainland by a wooden bridge. It was long a State prison, but is now an arsenal. Here François de Bonivard, a political prisoner, was incarcerated in 1530-38. See Byron, *The Prisoner of Chillon*.

Chiloé Islands. These is. off the W. coast of S. America form, with other smaller is., the insular prov. of Chiloé, with an area of 12,680 sq. m. The main is., 118 m. long by 35-40 m. wide, comprises five depts. and these are called Ancud, Chacao, Dalcahue, Castro, and Conchil. Castro, the anct. cap., is a seaport tn., and was founded by the Spaniards in 1556 under García de Mendoza. Another seaport, San Carlos, is the modern seat of gov. The climate is moist and healthy. Timber is exported. The chief products are potatoes and wheat. Pop. of prov., which includes strips of the opposite mainland, about 215,000. The cap. of the prov., Puerto Montt (pop. 20,000), on the mainland, has a wireless station.

Chilognatha, div. of the Myriapoda, is sometimes considered to be a sub-order of the Diplopoda, and sometimes coincident with it. Special characteristics are the seven-jointed antennæ, three pairs of legs on the thoracic segments, double pairs on the posterior segments, and genital organs opening usually on the seventh of these segments. Two of the genera are the *Glomeris* or pill-millipede, and *Julus*, or millipede.

Chilomo, see **CHROMO**.

Chilon, one of the seven sages, who fl. 620-550 B.C.; the reputed author of the maxim 'Know thyself.' He held the office of ephor; is said to have d. of joy when his son gained the prize for boxing at the Olympian Games.

Chilopoda, see **CENTIPEDE**.

Chilperic, name of two Frankish kings: *Chilperic I.*, assassinated in 583, was one of the four sons of Clotaire I. He tried to get possession of the whole kingdom on his father's death, but failed. *Chilperic II.*, son of Childeric II., king of Neustria; battled with Charles Martel. Reigned 715-21.

Chiltern Hills, range of chalk hills clothed with beechwoods extending partly through the cos. of Oxfordshire, Buckinghamshire, Bedfordshire, and Hertfordshire in England. The highest summit, near Wendover, lies 885 ft. above the sea. They extend some 45 m. N.E. from the Thames at Goring. Wendover Hill and Ivinghoe Beacon, both just over 900 ft., are the highest points. There is some beautiful scenery in the dist. which includes Ashridge, Hampden, Chequers, and other places of interest. See J. H. B. Peel, *Chilterns*, 1943.

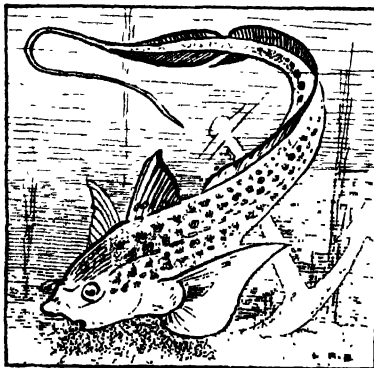
Chiltern Hundreds. 'Taking the Stewardship of the Chiltern Hundreds' is a very familiar parl. phrase applied to any member who wishes to resign his seat. The hist. of this phrase has arisen in this way: An old Eng. statute declared that no member of Parliament, once chosen, could vacate his seat in Parliament. This was afterwards amended in 1707, when it was stated that a member could resign, provided he held an office of profit from the Crown. Among these offices held by members of the House of Commons were eight crown stewardships, but these did not fall within the terms of the statute 1707, for no one holding these stewardships was exempt from parl. duties. It was not till the passing of the Place Act

In 1742 that the appointment to one of these crown stewardships served as an excuse for resignation. Only two of these stewardships survived, viz. Chiltern and Northstead in Yorkshire.

Chiltra, see CHATRA.

Chilvers Coton, par. and vil. of Warwickshire, England, 1 m. from Nuneaton. Coal is mined there. It is mentioned in Domesday as Celverdestoche. The Coventry Canal passes through the par. Pop. of par. 10,500.

Chimæra (Gk. *χίμαιρα*, yearling goat), mythical animal. According to Homer (*Iliad*, bk. vi.), it was a fire-breathing monster, with the head and fore-part of a lion, the body of a goat, and the hind quarters of a dragon. According to Hesiod, it was a three-headed monster, with the heads of a lion, a goat, and a dragon. It was slain by Bellerophon, with the help of Pegasus, in Lycia, where it had wrought much havoc. The origin of the myth has been traced to the volcano of the name of C., near Phaselis, in Lycia, and it is supposed that the summit of this mt. was frequented by lions and goats, and the marshy land at its base by monstrous serpents. The C. has often been presented in ant. and modern art. It is also used as a heraldic symbol on shields. The term is often used figuratively to denote an unnatural imagining of the fancy. In Botany C. is used as a name for the plants formerly known as graft hybrids.



CHIMÆRA

Chimæra, genus of fishes which holds a disputed place among the Elasmobranchs, to which the sharks and rays belong, and with the *Callorhynchus* forms the subclass Holocephali. They are distinguished by having four gill-clefts covered by an operculum, a few large teeth, no spiracle, one anal and two dorsal fins, and a long thin tail prolonged into a filament. The species inhabit deep water in Europe and America; *Ch. collett*

of N. America is known as the sea-cat, and *Ch. monstrosa*, the king of the herrings, is an ugly Brit. species about four feet in length, which is frequently captured by herring-fishers.

Chimborazo, mt. in S. America, one of the highest peaks of the Andes in Quito. The mt. is cone-shaped, perpetually snow-clad, and rises 21,424 ft. above the sea. Many attempts have been made to climb to its summit, and Whymper succeeded in gaining the top in 1880. The mt. gives its name to a prov. of Ecuador: area 2990 sq. m.; pop. 260,000; cap. Riobamba.

Chimbote, small seaport of Peru in the dept. of Ancachs, about lat. 9° 10' S. The tn. is the starting point of the railway to Huaraz, which is 172 m. to the S.E. It possesses a good harbour in Ferrol Bay. Many remains of a very early date have been found in the neighbourhood.

Chimere (Fr. *samarre*, O.F. *chamarre*, a loose, light gown), outer robe worn by a bishop to which the lawn sleeves are usually attached. In the Eng. Church the C., which, until the reign of Elizabeth, was of scarlet silk, is now of black satin. During episcopal conventions and when the king attends Parliament the C. is scarlet. Eng. prelates of the Rom. Catholic Church wear C.'s of purple silk; cardinals wear scarlet.

Chimes, series of sounds given by a set of attuned bells in a belfry or church tower. The bells may number from five to twelve (or more) and are sounded by performers, one to each bell. Chiming, specifically, is the gentler method of sounding bells, in which the performer moves the bell just enough for the clapper to strike its side, in contradistinction to ringing, in which the bell is swung round in a circle and starts from an upside down position or mouth upwards. C. differ from a *carillon* in that the bells are swinging, whereas in a *carillon* they are fixed and struck on the outside by hammers actuated from a manual and pedal keyboard similar in principle to that of an organ. See also BELL; CARILLON MUSIC.

Chimkent, or **Tchimbkend**, tn. of the Kazakhstan S.S.R. It lies on one of the sub-tribs. of the Syr Daria R., about 70 m. N.N.E. of Tashkent. Strategically and commercially the tn. is very important, for it stands near the junction of three railway routes—from Ferghana, Bokhara, Tashkent, Samarkand, and Stalinabad on the S., from the Aral Sea and Chkalov on the W., and from Alma-Ata and Semipalatinsk on the N.E. This point is at the W. end of a valley which separates the Alexander range and the Ala-tau. Consumptive patients take the *koumiss* cure here. C. has lead refineries.

Chimney, see TISMNIANS.

Chimney, enclosed passage, constructed in a wall, for the escape of smoke from the fire-place or furnace, and for the purpose of producing a draught to excite the combustion of the fire. Hot air is lighter than the cool air of the atmosphere, and consequently the air, heated by the fire, rises, pushing the smoke upwards. The draught caused by the escaping current of air is in proportion to the size of the C..

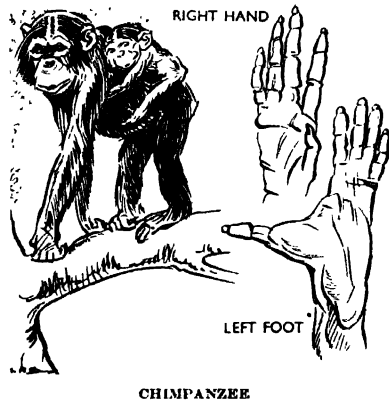
a greater draught being produced by a high C. than by a small one. As the draught draws the fire and causes intense heat, the C. stacks attached to factory furnaces are built to a great height. As an example the St. Rollox shaft, Glasgow, may be mentioned, which stands 455 ft. high. The usual proportions are for the height to be ten to fourteen times the diameter at the base, and the diameter at the summit two-thirds of the lower diameter. Cs. are usually constructed so that the draught and the smoke can be regulated by dampers. In manufacturing ins. regulations have to be made for the good of the community as to the length of time a chimney may smoke. Further, Cs. exceeding 100 ft. in height must show a red light to give warning to aircraft. Cs. are comparatively modern. In Gk. and Rom. houses it was usual to have a hole in the roof for the escape of the smoke. Cs. were first introduced into England, probably from Italy, in the late twelfth century. At first they were made with wide apertures which, in practice, have proved very inconvenient, as the inlet of large currents of outer air causes the C. to smoke. Ornamental chimney-pieces were a great feature of late Gothic and Elizabethan styles. In primitive Cs. the funnel sometimes projected into the room, but later the chimney-piece, with the fireplace round it, was regarded as one of the chief ornamental features of a room. Carved wooden chimney-pieces, adorned with niches and columns, were carried up to the ceiling, the lower portion being fitted with seats. Examples of fine stone Cs. may be seen in Windsor Castle, Tattershall Castle, and the Palais du Franc at Bruges. The material now in general use for chimney-pieces is marble. The term C. is used also to describe a narrow vertical cleft in rock.

Chimney-sweeper. Formerly young boys were employed to climb up chimneys for the purpose of cleaning them. They were subjected to such fearful cruelties by their masters that the matter was brought before parliament, and Acts were passed regulating the employment of Cs. in 1840, 1864, 1875, and 1894. These laws enacted that no person under the age of twenty-one might ascend or descend a chimney or enter a flue for the purpose of cleaning it; that no child under sixteen might be apprenticed to the trade; and that every C. must buy annually a licence costing 2s. 6d. The irritation of the soot frequently caused a disease known as C.'s cancer. In 1805 George Smart invented a 'chimney-sweep' which superseded climbing boys. It was a stiff, radiating brush of rattan, fixed on to a long rod, which consists of jointed sections of cane, and this form is still used.

Chimelo, or **Chimlyou,** riv. of Portuguese E. Africa, which flows first S.W., then N.W. to N., finally emptying itself into Lake Victoria after a course of 125 m.

Chimnanthus, small genus of Calycanthaceae, contains only two species, both of which are natives of China and Japan,

and are known as Japanese allspice. *Ch. vilens* is a beautiful evergreen, but *Ch. fragrans* is a shrub which drops its leaves in Nov. The flowers come out about Christmas time or early in the New Year upon the naked branches, and yield a delicious fragrance.



Chimpanzee, popular term for the genus of anthropoid Apes, or Simiidae, known technically as *Troglodytes*, or *Anthropopithecus*. These apes are closely related to the gorillas, but they have longer limbs, and there is little difference between the sexes, except that the female is the smaller. They inhabit trees, in which they build night-shelters, and all are natives of Africa. Unlike the gorillas, they are gentle and playful, and when kept in captivity they exhibit much intelligence; unfortunately, the climate of N. lands proves too much for them after two or three years. Their diet consists chiefly of fruits and nuts, but the Cs. are also fond of animal food.

China, more accurately the Chinese Republic, is an extensive dominion of E. Asia of which C. proper constitutes the prin. portion. For centuries this dominion has been known as the Chinese Empire, and it is hereinafter referred to as such, although the form of gov. is republican. It also includes the special ter. of Tibet. Its most northerly point is about 49° N. lat., while its S. extremity, the is. of Hainan, is in lat. 18° N. From W. to E. it extends over more than 80° of long., from 74° E. to 135° E. This vast extent of ter., estimated at about 3,875,000 sq. m., is larger in area than Europe, which it approximately equals in pop. C. proper occupies the S.E. portion of the empire, and is bounded on the S. and S.W. by Cochin C., Siam, Burma, and Tibet; on the N.W. by Kazakhstan; and on the N. by Mongolia and Siberia. On the E. is the Pacific Ocean, known by different names at various parts of the coast. Mongolia, or Outer Mongolia,

seceded from C. in 1915, becoming an autonomous republic in alliance with Russia after the 1917 revolution. In 1924 the U.S.S.R. acknowledged the suzerainty of C. over Mongolia, but by the Russo-Chinese treaty of 1945 it became completely independent. The country of Korea (Chosen), on the N.E., was once a dependency of C., but the suzerainty was not much exercised during the middle of the nineteenth century, and in 1895, after the disastrous war with Japan,

360 m. of sandy coast; then 350 m. bold and rocky to the gulf of Chihli; then 450 m. low and sandy to the parallel of the Chusan Is.; then 800 m. from Chusan to the bay of Canton, mostly high, bold, and rocky. A number of low, sandy is. form the coast near Canton, westward of which there is an alternation of low and bold shores. The whole coast, counting only the larger promontories and inlets, extends over about 2250 m., though if all the indentations be accurately estimated, the



THE GREAT WALL OF CHINA, AT THE HANKOW PASS

L.N.A

the dist. fell under the control of the latter country. At the same time Formosa (Taiwan) became part of the Jap. Empire and so remained until the Jap. defeat in 1945. After the Sino-Jap. war, 1931-1933, and the Jap. invasion of C., which was resumed in 1936, Manchuria, the N. Provs., and the greater part of the coastal regions of C. fell under Jap. control (*see under HISTORY infra*). The Chinese Empire has been characterised by exclusiveness from the beginning, and the practice of this feeling has been rendered easy by the geographical situation. The empire is cut off from the rest of Asia by high mt. ranges and tablelands. Except by the sea, it was difficult for foreigners to penetrate. The coastline is almost all that of C. proper, though near the borders of Korea Manchuria has a short coastline. From the borders of Korea, about 240 m. of the coast are bold and rocky. Then come

distance would be doubled. A considerable portion of C. proper is covered with mts., and the whole surface may be divided into the mountainous country, the hilly country, and the great plain. The mountainous country comprehends more than half of the whole, and the meridian of 112° E. may be considered its E. boundary, but to the N. of the Hwang Ho (Yellow R.) and it extends as far as 114°. The hilly country lies to the E. of 112° E. and extends N. to the Yangtze-kiang. The Great Plain occupies the N.E. part of C. It extends in length some 700 m., from the Great Wall, N. of Peiping (Peking), to the confluence of the rivs. Yangtze-kiang and Kankiang. Its width varies from 150 to 250 m. in the N. half, and from 300 to 500 m. in the S. half; the total area is about 210,000 sq. m. The W. end is the more fertile part, and it was to protect this from the inroads of nomadic Tartars that the Great Wall

was erected about 200 years B.C. This marvellous work extends over mts. and rivs. for over 1400 m. The main substance of the wall is earth or rubbish, retained on each side by a strong casing of stone and brick, and terraced by a platform of square tiles. It commences at the gulf of Liaotong, whence it extends westward to the Chiayu barrier gates, the workmanship gradually deteriorating. The thickness of the wall at the base is often as much as 25 ft. The mt. system must be considered in relation to the surrounding dependencies. The N. of C. proper is bounded by the Alanshan and the In Shan which are a continuation of the Tianshan Mts. of Siberia and Sinkiang. The same range then extends N.E. as the Khingan Mts., entering Manchuria and ending at the Amur R. The Altyn Tagh Mts. traverse the S. of Sinkiang, bound Tibet on the N. for a short distance, and continue in C. proper as the Nan Shan. Still further S. comes the continuation of the great range of N. Tibet, the Kunlun. This extension stretches right across C. separating the two rivs. the Hwang Ho and the Yangtze-kiang, under the names of the Peilingshan, the Tsinlingshan, and the Funiushan. All these mts. gradually diminish in height as they move eastward, and become covered with the loess, which forms so conspicuous a feature of N. China, and which contributes so greatly to its fertility. Almost parallel to the Kunlun, and forming a branch thereof, comes the Tangle range, which extends E. as the Tapashan. A S. branch of the Funiushan is the Hwaiyangshan. Offshoots from the Tangle range, itself a branch of the Himalayas, and from the continuation of the main Himalayan range, run almost due N. and S. along the S.W. boundary, chiefly through the provs. of Szechwan and Yunnan. However, the most extensive range of S. C. is the Nanlin or S. range, a spur of the Himalayas. It commences in the prov. of Yunnan and runs N.E. in sev. parallel ranges to the Pacific, where it ends at the mouth of the Yangtze-kiang. These ranges run through most of the S. coast provs.

The rivs. form one of C.'s conspicuous features. In the N., they usually bear the name *Ho*, in the S. that of *kiang*. There are numerous small independent rivs., but most of them fall into the Hwang Ho and the Yangtze-kiang, two of the largest rivs. of the globe. They rise in close proximity in offshoots of the Kunlun range in Tibet. The Hwang Ho flows for a time parallel to the mts., and then makes a large sweep to the N.E., through the prov. of Kansu. Its curve then follows the Alanshan range into Mongolia. Turning due S., it then forms the boundary between the provs. of Shensi and Shansi. At the S. of the latter it turns due E. again, and runs through Honan. It then inclines to the N.E. before entering Shantung, and enters the gulf of Chihli, N. of Laidow Bay, by sev. mouths. Its chief trib. is the Wei Ho, which rises in Kansu. The Hwang Ho is 2600 m. long, but it is of little use to navigation. Chinese tradition tells of

the part of the riv. in Shantung having changed its course no less than nine times, and the surrounding country is in continual danger of inundation. As a result there are no large tns. on this part of the coast. The Yangtze-kiang (Takiang, or Great R.) also rises in Tibet where it is known as the Ulan-Muran, and flows in a S.E. direction as the W. boundary of Szechwan. It makes a semicircular bend at the S. of this prov., and, after a tortuous course into Hupeh it turns to the S.E., then to the N.E., then S.E. again, and finally runs in a N.E. direction, to empty itself by an estuary into the Eastern Sea. This riv. is the chief waterway of C. Its total length is 3400 m., and along its banks are many flourishing cities, among which may be named Hankow, Wuchang, Chungking, and Nanking. The riv. is navigable by large steamers to Ipin and for junks, to the border of Szechwan-Sikang-Yunnan. Its chief tribs. on the l. b. are Min Ho, the Chialing, and the Han, on the r. b. the Yuan and the Kan. The West R. (Sikiang) begins at Hsuanwei in N. Yunnan and flows through Kweichow, Kwangsi, and Kwangtung. At Samshui its southward arm the Canton R. enters the S. China Sea at the port of Canton. The Grand Canal, or Yun Ho, is the oldest and longest in existence. It was commenced in 540 B.C., and is 1300 m. long. This great waterway commences at Hangchow, in the prov. of the Chekiang, and extends to Tientsin in Hopei, where it joins the Pai, and thus gives direct communication with Tung and Peiping. When the canal was in good condition it well fulfilled the purpose of its maker Kublai, the first sovereign of the Yuan dynasty, in forming a communication between N. and S. China. It has now been largely superseded by steamer routes along the coast and has been allowed to fall into disrepair. The rest of C. is also intersected with many canals, which connect various rivs. and lakes. Parts of the country indeed, are a veritable network of waterways. There are many lakes, but these are not on so large a scale as the rivs. Three only need be mentioned: (1) The Tungting, on the Yuan R., about 250 m. in circumference. Two canals connect it with the Yangtze. (2) The Poyang at the N. of the prov. of Kiangsi, is smaller than the Tungting, and about the same size as (3) the Tai, to the S. of Kiangsu.

Provinces.—Mention has already been made of sev. of the provs. of C. proper. They are twenty-two in number, and may now be briefly enumerated. The first seven extend wholly or partly over the great plain; the next two comprehend the hilly dists., two others the mountainous country along the sea, and the remaining eleven include the mountainous country in the interior and W.: (1) Hopei extends over the most N. and less fertile part of the plain. In it are situated the important tns. of Peiping and Pao-ting. (2) Shantung comprehends part of the plain and the peninsula of Shantung. Chief tns., Tsinan, Yenchow, and the ports of Weihaiwei, Tsingtao, and Chefoo. (3)

Kiangsu includes the low and swampy country on both sides of the Imperial Canal. It contains the cities and tns. of Chinkiang, Soochow, Nanking, and Shanghai. (4) Anhwei, on both sides of the Yangtze, has for its chief tn. Hwai-ning (Anking). (5) Honan, on the W. margin of the plain. Chief tns., Kaifeng and Honan. (6) Hupeh, in the centre of the plain, is one of the most fertile provs. Chief tns., Wuchang, Hankow, Hanyang, Siangyang, and Kingchow. (7) Chekiang, in the S.E. of the plain, is the chief green tea prov. Chief tns., Hanchow, Wenchow, and the port of Ningpo. (8) Kiangsi, to the N.W. of the Nan'ang range, is the great porcelain prov. Chief tns., Nanchang, Kiukiang, and Kingan. (9) Hunan, in the hilly country, is rich in cereals. Wolfram is mined there. Chief tns., Changsha, Yunchow, and Hengchow. (10) Fukien, on the shores of the sea opposite Taiwan (Formosa), is the chief black tea dist., and one of the most fertile and flourishing of the Chinese provs. The chief tns. are Fuchow, Chuanchow, and the port of Amoy. (11) Kwangtung, or Canton, the southernmost prov., contains the celebrated city of the same name, Swatow, and Luchow. Not far from Canton is the Brit. crown colony port of Hong Kong and the Portuguese Macao. The Is. of Hainan, to the S. of the Leitchow peninsula, forms part of this prov. (12) Kwangsi, occupying both banks of the Sikiang R., is a mountainous prov., of which the chief tn. is Kweilin. (13) Kweichow is a very mountainous prov. to the N. of Kwangsi, and is especially rich in minerals. Its chief tn. is Kweiyang. Like Kwangsi, it contains aboriginal tribes, different from, and hostile to, the Chinese. (14) Yunnan, the most south-westerly prov., is an irregular table-land, and is rich in minerals; the two chief tns., Yunnan and Yunchang, carry on a considerable trade with Burma and Siam. (15) Szechwan is a succession of hills and valleys, rich both in mineral and in vegetable produce. Its chief tns., Chengtu and Tungchwan, are places of great pop. and trade. Chungking, the Chinese cap. during the Second World War, stands on the Yangtze. (16) Shensi is a rugged country with wide fertile valleys; its chief tn., Sian, is very large, and was once the cap. of C. (17) Shansi, adjoining the Great Wall, is a mountainous but fertile prov. Its chief tns. are Taiyuan and Ta-tung. (18) Kansu, in the N., is sterile and thinly peopled. Its chief tn. is Lanchow. (19) Sikang lies between Szechwan and Tibet and is watered by the Yangtze. The cap. is Kanking. (20) Chinghai, N.E. of Tibet, is sparsely populated. The prov. is mountainous and the terrain in the valleys is generally unsuited for crops, being loess or shifting sand. The chief tn. is Sining. (21) Sinkiang, comprising the greater part of the area known formerly as E. or Chinese Turkestan, is the most easterly and largest prov. of C., cap. Tihwa. (22) Taiwan, or Formosa, now has the status of prov. The Is. has gold and coal mines, but the chief industry is

agriculture, tea and sugar being exported. The cap. is Taipei. The N. area of C., stretching from the E. of Sinkiang to Manchuria in the N.W., is known as Inner Mongolia and contains the provs. of Ningia, Suiyuan, Chahar, and Jehol. The provs. of Antung, Hellungkiang, Hokiang, Hsingan, Kirin, Liaoning, Liaopeh, Nunkian and Sunkiang, and the municipalities of Harbin and Shenyang (Mukden), comprise Manchuria (*q.v.*) The Special Ter. of Tibet is nominally a dependency of C., but preserves a great measure of independence. In 1914 a conference of delegates of C., Tibet, and Great Britain considered a Convention recognising the autonomy of Tibet proper (outer Tibet) and created a zone (inner Tibet) under Chinese authority subject to existing Tibetan rights. The Chinese Gov. did not ratify the Convention though they accepted its terms in all respects save the boundaries between inner and outer Tibet. C. administers Inner Tibet through the Mongolian and Tibetan Affairs Commission of the Executive Yuan and maintains a representative at Lhasa, the cap. (*see* TIBET).

Climate.—The climatic conditions naturally vary considerably over so large a stretch of country. In the lofty Tibetan plateau and the less elevated plains of Mongolia the climate is exceedingly dry, and is marked by great extremes of hot and cold. The basins of the two great rivs., being nearer the Pacific, are moister and more equable. In this part of C. proper the dry season lasts from Nov. to Feb., the remaining months, particularly May, being extremely wet. The rainfall is of a copious tropical nature. Generally speaking, C. is a cold country in comparison with European ters. in the same lat. From July to Sept., however, the weather is intensely hot, and the heat is accompanied by typhoons, which are much dreaded for their violent and devastating effects.

Area and Population.—The area and estimated pops. (1947) of the provs. and municipalities of C. are given in the table opposite.

Communications.—C. is intersected in all directions by roads and canals. Before and during the Second World War two great motor roads were built to connect China with the outside world. From Chungking the Sinkiang Road runs N.W. to the Turkestan railway in Russian Turkestan, and the famous Burma Road through Yunnan to the railroad at Lashio in Burma. A motor road to the N.W., connecting Szechwan with Sinkiang and running through that prov. to the Turkestan-Siberian railway is under construction. The distance is 2500 m. from Chungking, to the nearest point on the Soviet line. A railway and a motor road now connect C. with Fr. Indo-C. For the rest the roads are mostly mere tracks, but such as they are they have been used for centuries. Twelve of the anct. trade routes have been used from time immemorial. There is an important trade route from Peking to Lhasa, from which tn. there are further

<i>China</i>	<i>Provinces and Municipalities</i>	<i>Area in sq. miles</i>	<i>Estimated Population 1947</i>	<i>Capital</i>
CHINA PROPER, AND INNER MONGOLIA (PROVINCES MARKED *)	Anhui	54,305	21,705,000	Hwaining (Anking)
	*Chahar	107,677	2,115,000	Wanchuan (Kalgan)
	Chekiang	39,463	19,942,000	Hangchow
	Chinghai	269,117	1,346,000	Sining
	Fukien	45,833	11,101,000	Foochow
	Honan	64,528	28,473,000	Kaileng
	Hopei	54,140	28,529,000	Chingyuan (Paoting)
	Huan	79,358	26,171,000	Changshan
	Hupei	71,937	21,034,000	Wuchang
	*Jehol	74,278	6,110,000	Chengtch
	Kansu	151,121	6,798,000	Lanchow
	Kiangsi	66,583	12,725,000	Nanchang
	Kiangsu	42,045	30,052,000	Chingkiang
	Kwangsi	85,430	14,603,000	Kwellin
	Kwangtung	85,425	27,826,000	Canton
	Kweichow	68,122	10,519,000	Kweiyang
	*Ningsia	106,115	773,000	Ningsia
	Shansi	60,378	15,025,000	Taiyuan
	Shantung	55,801	38,672,000	Tsinan
	Shensi	72,900	9,492,000	Shan
	Sikang	164,848	1,651,000	Kangting
	Sinkiang	705,769	4,012,000	Tihwa
	*Suiyuan	134,146	2,167,000	Kweisui
	Szechwan	144,959	47,108,000	Chengtu
	Taiwan (Formosa)	13,886	6,126,000	Taipei
	Yunnan	162,300	9,171,000	Kunming
	Chungking	116	1,000,000	
	Nanking	180	1,038,000	
	Peiping	273	1,602,000	
	Shanghai	345	3,851,000	
	Tientsin	21	1,679,000	
	Tsingtao	289	733,000	
MANCHURIA	Antung	24,181	3,164,000	Tung-hwa
	Hailungkiang	76,542	2,564,000	Pechan
	Hokiang	47,717	1,936,000	Kiamusze
	Hsingan	89,724	328,000	Hala
	Kirin	33,692	6,981,000	Kirin
	Liaoning	25,962	9,992,000	Shenyang (Mukden)
	Liaopeh	47,603	3,798,000	Liaoyuan
	Nunkiang	25,849	2,407,000	Tsitsihar
	Sunkiang	31,185	4,535,000	Mutankiang
	Harbin	359	760,000	
	Shenyang (Mukden)	88	1,176,000	
	Tibet (Special Territory)	466,294	3,000,000	Lhasa
	TOTAL	3,864,184	459,813,000	

extensions to India and N. Tibet. The whole length of the Himalayas is crossed by numerous passes, which make the transit from Tibet to India easy. The two most convenient are those by the Pariyong and Karkangla Passes. The chief ant. trade route from C. to Russia runs from Peiping through Mongolia, near Kialkhta on the Siberian frontier. Another route runs from Hankow through

the N. of Kansu, ultimately reaching Chkalov. The great central Asian trade route, with a total length of nearly 3500 m., runs from Peiping to Kashgar in Sinkiang. The Chinese portion passes through the provs. of Shansi, Shensi, Kansu, and thence to Hami, Urumtai, and Kashgar. In 1921 a Good Roads movement was started, and met with considerable support. Two roads were

advocated from Shanghai, one to Nanking and the other to Hangchow. The Peiping to Tien-Tsin road was completed, and Peiping and sev. other tns. have macadamised thoroughfares. The laying down of railways was started about 1870, the first line to be opened being from Shanghai to Wusung (12 m.). But the opening of this line in 1876 caused such trouble that no work was resumed until the nineties. Then a N. line was constructed through Manchuria to join the Russian trans-Siberian line. The prin. railways are the Peiping-Hankow railway (814 m.); Tientsin-Pukow railway (686 m.); Canton-Hankow railway (768 m.); Peiping-Mukden (Shenyang) railway (832 m.); Nanking-Shanghai railway (247 m.); Shanghai-Hangchow-Ningpo railway (179 m.); Lung-Hai railway (687 m.); Kiaochow-Tsinan railway (285 m.); Peiping-Suiyuan railway (540 m.); Chekiang-Kiangsi railway (400 m.); Tatung-Puchow railway (390 m.); Yunnan railway (Tonkin frontier to Kunming, 290 m.); S. Manchuria railway, from Chungchun to Dairen (696 m.); the Chinese E. railway, running eastwards from Manchuli through N. Manchuria to Suifenho, at which latter place it joins the Ussuri railway and then runs E. to Vladivostok and thence S. from Harbin to Changchun to join the S. Manchuria railway. This line was constructed by the Russians and, under agreements made in 1896-98, was operated by Russians and Chinese. It runs for nearly 1500 m. in Chinese ter. In 1935 the Soviet Gov. sold the Chinese E. railway to the Jap.-controlled gov. of Manchukuo, in spite of the Chinese Gov.'s protest against the sale. C. has a fairly well developed telegraph service. Telegraphs connect all the prin. cities in the country, and there are lines to all the neighbouring countries. The telegraph lines have a total length of over 60,000 m. In 1896 a postal service throughout the empire was estab., and serves all the ports and important tns. Wireless telegraphy is also estab., and many broadcasting stations on the short-wave system have been estab. for the past ten years or more. Civil war held up the development of commercial aviation, but in 1929 a Sino-Amer. enterprise was set on foot to provide a daily air-mail service. The total length of the air-mail lines at the beginning of 1936 was 8250 m. The Saigon-Marseilles, Bandoeng-Amsterdam, and Imperial Air Lines have been used for forwarding mails from C. to countries in Europe, Africa, and S. Asia.

Cultivation, Fauna, etc.—The Chinese are essentially an agric. people, and the fertile nature of the country aids their own assiduous efforts. Wheat, barley, millet, and other cereals are cultivated mainly in the N., while in the S. attention is chiefly given to rice. The flora and fauna are both that of the temperate zone, so most of the common European vegetables are everywhere produced and used. In the S. regions, the S. fruits, such as oranges, pomegranates, peaches, plantains, pineapples, grapes, and the sugarcane, flourish well. The tea plant is ex-

tensively cultivated in the S. and W. provs. The use of tea as a beverage was once little known, but it is now universally used throughout the country. The larger and more ferocious descriptions of carnivorous quadrupeds are not common in a country so well peopled and cultivated. The Bengal tiger sometimes appears in the forests of Yunnan, but this is rare, while the lion only occurs in sculpture. Old writers also speak of the rhinoceros, tapir, and elephant as common in C. Cattle, sheep, and horses are comparatively rare, but the yak and the goat are bred extensively in Tibet, where also



Paul Popper

A FARMER OF HUPEH PROVINCE

the panda bear is found. An animal peculiar to this region is the dzo, a cross between the yak and the zebu, which, however, reverts to the original types after the fourth generation. The cultivation of opium is an industry which the Chinese Gov. has attempted to eradicate. Up to the outbreak of civil war in 1917 these efforts were successful. War, however, led to a neglect of the opium regulations. In 1913 the Indian Gov. prohibited the export of Indian opium into C. The normal wheat harvest of C. is officially reckoned at 3,000,000 tons, while 40,000,000 tons of rice are grown for home consumption. In 1927 the soya-bean harvest in Manchuria reached over 4,000,000 tons. Famine, however, has of late years been rife in C.; in Honan the grain and rice harvest failed in 1942 through drought and locusts, affecting 20,000,000 people.

Minerals.—War and the consequent interruption of transport have impeded the development of the mining industry,

but a movement is now on foot to nationalise the mines. The coal reserve of C. is estimated at about 30,000,000,000 tons. The richest fields lie in Shansi (E.) and Hunan (S.). The former of these, an anthracite field, has an area of nearly 15,000 sq. m., and the W. half of the same prov. has even richer stores of bituminous coal. Almost the whole of the S.E. Hunan has coal beneath the surface, but in parts it lies too deep to be mined. The provs. of Szechwan, Kansu, Hopei, and Shantung also contain vast stores of this precious mineral. The average export of coal is 3,000,000 tons a year. Iron-mining has been carried on for thousands of years, but only those ores which could easily be extracted and smelted by primitive methods have as yet been utilised. The reserve of iron ore is estimated at 1,200,000,000 tons, and the average ann. export is about 600,000 tons, most of which has either gone to Japan or, in more recent years, has been seized by that country. In Manchuria, coal and iron lie close together, and here the industry has been rapidly developed. There is much iron in Shansi, and some in Hunan; in the latter prov. some silver and lead are found. Gold is obtained chiefly from the streams in Szechwan, and it is also in this prov. that copper is mined. Yunnan is a rich mining prov., and produces tin, copper, iron, lead, and silver. Tungsten was discovered in 1915, and C. is now the second largest producer in the world, while about 70 per cent of the world's antimony also comes from C. The ann. output of antimony is 1600-1900 tons. Of manganese the production is about 100,000 tons a year. Molybdenum, mercury, soda, and saltpetre deposits are also found, but the copper mines are closing up. Szechwan is rich in petroleum, and the Geological Survey, 1921, placed C.'s resources of petroleum next after iron and coal, but they await development. The total output of salt is some 3,000,000 metric tons annually.

Industry.—The Chinese, having behind them more centuries of continuous development and civilisation than any European power, naturally show many of the inventions upon which we most pride ourselves at an early date. Printing by means of movable type was known in C. centuries ago, and there are still Chinese books of this kind extant which were printed long before the time of Gutenberg. However, this system of setting up type, which is found so useful in languages where the number of letters is strictly limited, is less so in such a language as Chinese, where there are some thousands of characters, and printing from carved blocks has been much more favoured. The making of paper also goes back some centuries before the Christian era. The Chinese excel especially in routine work requiring great patience and technical skill but no originality. Their carvings and engravings on wood, metal, stone, ivory, and crystal, their gold and silver work, lacquer work, and bronze casting are deservedly world-famous. Foreign methods have

now been introduced into their manufactures, and much is done by machinery. Iron works of all kinds, wool and cotton factories, flour mills, match factories, etc., have all been introduced. Tea was originally the prin. Chinese export, but owing to the competition of Indian and Ceylon teas it fell rapidly. An improvement is noted from 1905 onwards. Tea is especially cultivated in the S. and W. provs., in Fukien, Hupeh, Hunan, Kiangsi, Chekiang, Kwangtung, and Szechwan. More important is the silk industry, though it is not yet in as prosperous a condition as it might well be. However, before the Second World War a quarter of the world's supply of silk came from China. Total export of raw silk amounted to nearly 4,000,000 lb. in 1937 and over 2,500,000 lb. in 1938. In the provs. of Hopei (Chili), Kiangsu, and Hupeh, cotton is grown, and C.'s ann. export (1927) was just under 239,000,000 lb. In 1937 C.'s raw cotton exports were valued at 36,000,000 standard dollars, and in 1938 at 101,000,000. C. ranks next after the U.S.A. and India as a cotton country, but owing to the growth of her manufs. C. receives supplies of raw cotton from both these countries. Since there are about 20,000,000 sheep in C., wool is an important product both for the rug industry and for export. The total export of wool, made from sheep, goat, and camel hair, has been as high as 50,000,000 lb. The flour-milling industry flourishes, having been first introduced by the Russians in Harbin. Including match factories, tanneries, etc., there were, in 1931, about 1500 modern factories in C., besides a great number which were less up to date, but many have been destroyed by the Jap. invaders. A number of the cotton mills were owned by the Jap., and of the 2,025,000 bales of cotton yarn produced in 1935, 1,438,000 bales were produced in Chinese, 547,000 in Jap., and the residue in Brit.-owned mills. Some parts of the W. provs. during the Second World War became centres of industrial activity; Szechwan received many factories transported bodily from the E. and central provs. as the Jap. advanced along the railways and rivers of pre-war industrial dists. Egg products provide a large export industry. C.'s foreign trade is a development of the last century. The Portuguese estab. a trading port as early as 1522, but in the course of centuries there was no sign of change in the gov.'s attitude of suspicion and hostility to foreigners. All official recognition and protection were refused to traders until 1842, the year of the treaty of Nanking. Since that time the number of treaty ports, through which commerce is permitted, has been gradually growing. The figures* on the next page (from *The Statesman's Year Book* for 1939) give C.'s foreign trade, exclusive of bullion, in recent years.

In 1938 the tea export was 239,000 quintals to Hong Kong, 2410 piculs to Russia, 21,000 to the U.S.A., 9023 to Great Britain, and 3284 to France.

Shipping and Navigation.—In 1927 the carrying trade was much harassed by

	1934	1935	1936	1937	1938
Net Imports	Dollars 1,029,695,000	Dollars 919,211,000	Dollars 941,545,000	Dollars 953,386,000	Dollars 886,197,000
Exports	535,214,000	575,809,000	705,741,000	838,256,000	762,641,000

Trade by prin. countries in 1937 and 1938 in thousands of standard dollars (net total values) was as follows:

	Imports		Exports	
	1937	1938	1937	1938
	1000 standard dollars	1000 standard dollars	1000 standard dollars	1000 standard dollars
Great Britain	111,695	70,606	80,380	59,769
Hong Kong	19,078	24,589	162,901	243,395
India (excluding Burma)	12,467	16,214	11,791	19,720
Russia	704	5,491	4,591	613
France	15,106	18,304	32,643	20,402
Singapore	10,362	7,312	19,213	17,545
Italy	9,906	17,465	6,840	1,260
U.S.A.	188,859	151,254	231,449	86,850
Japan	150,432	209,864	84,306	116,554
Germany	146,374	112,939	72,447	56,430

The chief imports and exports for 1937-38 were as follows, in standard dollars:

Imports	1937	1938	Exports	1937	1938
	1000 standard dollars	1000 standard dollars		1000 standard dollars	1000 standard dollars
Raw cotton, yarn, and thread	20,550	17,461	Animal products	121,494	117,903
Cotton piece goods	14,669	22,540	Oils, tallow, and wax	127,040	53,053
Wool and woollen goods	35,604	18,889	Seeds	35,881	19,499
Metals and ores	131,638	65,118	Raw cotton	31,301	101,033
Fishery products	13,258	9,941	Raw silk	45,866	33,604
Tobacco	21,874	22,602	Hides, skins, and leather	53,785	19,426
Chemicals	61,282	57,117	Tea	30,787	33,054
Dyes and paints	37,105	31,116	Chemicals	7,621	7,979
Coal, coke, etc.	5,995	21,502	Metals and minerals	102,453	106,571
Machinery	65,013	56,399	Piece goods	22,426	24,450
			Paper	7,000	7,758
			Cereals, etc.	15,170	4,851
			Beans and peas	6,465	3,137

piracy. Normal conditions did not return until March 1928. Conditions were again disturbed in 1931 during the Sino-Jap. war of that year; and later, in 1936, when the Jap. invaded the country, conditions became chaotic. C. is peculiar in that its inland navigation is open to foreign vessels by various treaties. The vessels which entered and cleared Chinese ports during 1938 numbered 74,890, with an aggregate tonnage of 29,430,000. The percentages of this tonnage were Brit., 48; Jap., 24; Chinese, 8; Fr. Ger., Nether-

lands, Norwegian, and Portuguese between 3 and 4.

Currency, Measures, etc.—The coinage of C. has varied considerably during the ages. At one time the sole official monetary unit was the copper cash, of which 1000 (or in practice 1220) equalled one *haikwan* (or customs) *tael*. The *tael* is not a coin, but a weight of silver, and its value fluctuates with the value of silver. In 1928 the Hong Kong *tael* was equal in value to 2s. 11½d. A convention treaty with Great Britain in 1902 pledged C. to

inaugurate a standard national coinage. In 1908 an Imperial decree was issued, which made the silver tael coin of 0.98 touch, weighing one treasure-scale tael, the unit. In 1910 this decree was cancelled, and a further edict estab. the silver dollar of 0.90 touch, weighing 0.72 treasury-weight tael, as the new unit. In 1928 the National Gov. decided that the tael should cease to be current after July, when it was proposed to mint a new uniform dollar as legal tender. The foreign dollar has had a successful career in C., and the first Chinese dollar had appeared in 1889. In 1914 a republican dollar was coined, and in 1927 this was replaced by the Sun Yat-sen dollar. The tael, as the commercial unit of exchange, has been abolished since early in 1933, and the present unit of currency is the silver dollar, the rate of exchange being fixed as 1 dollar to 0.715 tael. In 1930 the Brit. Gov. announced its decision to assist in establishing a £10,000,000 Chinese exchange stabilisation fund. (The exchange rate is now fixed by the Foreign Exchange Equalization Fund Committee, which was set up on Aug. 17, 1947. The exchange rate as at the end of 1947 was C. N. \$225,000 = £1 and C. N. \$73,000 = U.S. \$1.) In 1935 the gov. adopted a scheme of monetary and banking reforms, including the following provisions: The bank-notes issued by the Central Bank of China, the Bank of China, and the Bank of Communications to be full legal tender; no use of silver dollars or silver bullion for currency purposes to be permitted; bank-notes issued by banks (other than those mentioned above) to be gradually retired and exchanged for Central bank-notes; a Currency Reserve Board to be formed to control the issue and retirement of legal tender notes and to keep custody of reserves against the outstanding bank-notes. Early in 1936 the gov. promulgated the Subsidiary Currency Act, after which a new series of subsidiary coins were to be coined by the Central Mint (estab. in Shanghai) and issued by the Central Bank. This new coinage consists of pure nickel coins of three denominations—5, 10, and 20 cents. There are also copper coins of 1½ cent each. The prin. weight measures are the liang or tael (1½ oz. avoirdupois), of which sixteen make one chin or catty (1½ lb. avoirdupois); 100 chin make one tan or picul = 133½ lb. These measures are also used for liquids. Though, in C., standards of weights, measures, and lengths vary all over the country, generally speaking two kinds of standards, the old and the new, are in use. The old standard was formulated from a law promulgated in 1914, establishing a double system, the standard metric unit and that based on *ying tao ch'ih*, or 'builder's foot', for length, and keeping tael or liang for weight. The law governing the new standard was promulgated in 1929 and was intended to be the legal standard of weights and measures throughout C. For convenience' sake and customary usage it also estab. a double system; one is the standard metric unit, which came into operation in the Chinese

customs service in 1934. Kung Lee equals the millimetre; K. Fen, centimetre; K. Tsou, decimetre; K. Chih, metre; K. Chang, dekametre; K. Yin, hectometre; K. Li, kilometre. The other, which is temporary in character, is designed only for market use and is to be abolished as soon as the people grow accustomed to the new system.

Finances.—C. has issued five budgets since the estab. of the republic, but after 1923 budgeting was interrupted by civil strife. In 1928, however, a budget committee was formed under the National Gov., but no results have yet been forthcoming. In 1937-38 the revenue amounted to \$879,000,000 and expenditure to \$950,000,000. Military expenses figured the most heavily at \$362,000,000. The chief sources of revenue are the land tax and the customs, the produce of the gov. lands, and the salt, kerosene, wine, and tobacco taxes. Following the example of the U.S.A. in returning to C. her share of the 1900 Boxer indemnity, Great Britain in 1930 agreed also to return her share of that indemnity, as from 1922, to the control of the Chinese Gov., stipulating that the bulk of the funds thus remitted be applied to railway construction and education. All C.'s foreign loans were contracted before 1925. In recent years the only indebtedness incurred by C. has been in the shape of credits granted by the U.S. Gov. on the purchase of cotton and wheat. Foreign loans secured on customs revenue have been regularly amortised with interest paid by the National Gov. The obligations of those secured on salt revenue have also been regularly met in principal and interest, including arrears of interest. At Jan. 1, 1937, the outstanding foreign debts owed by the Chinese Gov. were the following (enumerated in the currencies in which they were contracted): £46,424,000; (U.S.) \$58,403,000; 100,000,000 francs; 45,478,000 yen; railway loans: £16,373,000; 44,750,000 francs; 50,000,000 yen; 137,743,000 (Belgian) francs; 23,000,000 florins.

Government.—The constitution of the National Gov. of the republic came into legal force on Oct. 15, 1928. The National Gov. is the creation of the Kuomintang (People's National Party), and after the unification of C. under the Kuomintang flag, a central political council was set up, and in 1929 this was reconstituted to consist of twenty-four members and eight reserve members. This council formulates the policy of the National Gov., which consists of a president and from twelve to sixteen state councillors. The National Gov. comprises five *yuan*, and the presidents and vice-presidents of these are elected from among the state councillors. The *Executive Yuan* supervises the work of the various executive ministries and commissions. These are Ministry of (1) Interior; (2) Foreign Affairs; (3) National Defence; (4) Finance; (5) Economic Affairs; (6) Education; (7) Communications; (8) Agriculture and Forestry; (9) Food; (10) Justice. The executive *yuan* includes also the

following commissions; Mongolian and Tibetan Affairs; Overseas Affairs; National Conservancy; and the National Relief and Rehabilitation Administration, National Resources Administration, National Health Administration, and National Land Administration. The *Legislative Yuan* is the highest legislative organ with power to decide matters concerning legislation, budgets, amnesties, war and peace, and the conclusion of treaties. The *Judicial Yuan* comprises the Ministry of Justice, the Supreme Court, the Commission for the Disciplining of Officials, and the Administrative Court. The *Examination Yuan* has charge of the examinations for the civil service and other related matters. Its members are appointed by the President with the consent of the *Control Yuan*, which comprises the Ministry of Audit and also conducts the impeachment of officials. The provs. excluding Mongolia and Tibet, are administered under a prov. gov., consisting of a chairman and thirteen members. The municipal gov. under a mayor is responsible to the provincial gov., but there is also a special municipal gov., if the pop. of the tn. exceeds a million, which is directly responsible to the National Gov. Administration is further subdivided into a local gov. for each dist. or *hsien*, which consists of a number of sections and vils., each with its chief or elder. (By a recent republican ordinance the *hsien* now includes co. cities). See also under *History*.

A new constitution, 'Constitution of the Chinese Republic,' was adopted by the National Assembly on 25 Dec. 1946 and became effective on 25 Dec. 1947. This constitution contains 175 Articles and was first formally pub. by the National Gov. on May 5, 1936. According to the original scheme, the Constituent National Assembly was to be convened at the end of 1937, but this was prevented by the war with Japan. This new constitution is permeated with the principles and teachings of Sun Yat-sen especially his *San-Min-Chu-I*—the purpose of which is to make C. a free and independent state, free from the control of any other nation, a democratic state in which the sovereignty is vested in the body of its citizens. Besides the liberty of the person, the constitution (or constitution *in potentia*) provides that every citizen has freedom of domicile, freedom to change his residence, freedom of speech, writing, and publication, freedom of assembly and association, freedom of religious beliefs, the right to private property, the right to present petitions, lodge complaints, and institute legal proceedings, the right to exercise the powers of election, recall, initiative, and referendum, the right to compete in state examinations, and all other liberties and rights not detrimental to public peace and public welfare. Article 8 is important in that it provides that all citizens of the republic of China shall be equal before the law—hence the equality of women with men is by implication constitutionally guaranteed. The political powers (*i.e.*

election, recall, initiative, and referendum) in the dists. and other local units of self-gov. are to be exercised directly by the people. As to the central gov., they are to be exercised by the National Assembly for the people of the whole of C. The governmental powers (as in the previous constitution) are executive, legislative, judicial, control, and examination. Hence the so-called five-power constitution, as against the ordinary three-power constitution of the W. These governmental powers, being really functions, are entrusted by the nation to the hands of the National (Central) Gov. The National Assembly is constituted of delegates selected directly by the citizens of the *hsien*, the prin. self-governing units, and the municipalities. The election of delegates from Mongolia, Tibet, and the overseas Chinese are determined by special laws. The Assembly numbers approximately 2000 delegates and the term of office of the delegates is six years. The Congress is to meet every three years and its session to last one month, or at most two. According to Sun Yat-sen's theory, the five governmental powers should be exercised by the five *yuan* of the Central Gov. In this constitution it is provided that the executive, legislative, judicial, control, and examination are the highest organs through which the Central Gov. exercises its executive, legislative, judicial, and other powers respectively. But over and above them is the President, who, besides being the head of the state and the representative of the republic in foreign relations, is also the chief of the executive and the co-ordinator of the five *yuan*. He holds some measure of check or supervision over all the *yuan*, but has complete control over none except the executive *yuan*, whose president is to be appointed by and directly responsible to him. The presidents and members of the legislative and control *yuan* are to be appointed directly by the assembly, and, with the exception of the president of the executive *yuan*, the presidents of all the *yuan* are directly responsible to the National Assembly. Complicated as it might seem at first sight, the system is conceived to secure a certain degree of independence for each of the governmental depts., and provides a kind of check and balance among them. For fuller information consult the speeches of Sun Fo (son of Sun Yat-sen), collected and pub. under the title *China Looks Forward*, 1944.

Army and Navy.—The military profession is despised among the Chinese, and hitherto the mercenary system has prevailed. In 1928 the reorganisation of the army was one of the first problems facing the National Gov. On July 11, Chiang Kai-shek, the president, summoned the military commanders to a conference at Tangshan. A memorandum was drawn up and submitted to the Central Executive Committee. The more detailed memorandum which the committee adopted laid down that from sixty to seventy divs. of 15,000 men each should be organised out of the best existing units.

A gendarmerie of sixty battalions of 500 men each was also to be formed. On Jan. 1, 1929, a commission was set up to undertake the work of reorganising and disbanding the then existing army of over 1,500,000 men. At the outbreak of the war with Japan the organised forces at the disposal of the Central Gov. were estimated to be about 1,600,000, consisting of 135 infantry and 11 cavalry divs., but much of this organisation was on paper only. At the end of 1938 it was estimated that the Chinese forces in the field numbered about 900,000 men. In 1898, four years after the Chino-Jap. war, C. purchased five of her best cruisers, the largest of which, the *Hai Chi*, is 4300 tons. Further foreign purchases included two training-ships from Great Britain in 1911. In 1929 the gov. requested and received the services of a Brit. naval mission to reorganise the training of the fleet. As a result of hostilities with Japan most of the ships comprising the Chinese Navy have ceased to exist, including all the cruisers and a large proportion of the gunboats. There are no important naval bases. Existing dockyards are Taku, Foochow, Kiangnan (Shanghai) and Amoy (Fukien). Chinese military aviation commenced in 1919 with the purchase of six Handley-Page machines, forty Vickers Vimy, and sixty-five Avro, originally intended for commercial use only. An air dept. was subsequently estab. for the reorganisation of the air force.

Education.—For many centuries there has been a national system of education, dealing only with the study of Chinese literature and hist., but this was abolished in 1905, when the system of examinations giving entrance to state employments, to which this training was preparatory, was also abolished. There was, however, no attempt at reform until the 1911 revolution, which in its beginning was largely the work of the Chinese students returned from abroad. In 1910 roughly 30,000 students studied in Japan, but owing to a subsequent reaction against Jap. imperialism these numbers dropped to about 5000 in 1927. In that year there were about 2000 students in the U.S.A. and 600 in Europe. There has always been a genuine desire among educated Chinese to acquire what is best in W. culture, at the same time allowing for its defects. A scheme to co-ordinate the national system of education accompanied the political reconstruction of C., and a national conference was held in 1928. It was decided that the Three People's Principles laid down by Sun Yat-sen, the late leader of the Kuomintang, should be taught in all schools. Elementary, secondary, and higher education are provided for, while there are also vocational and technical schools. Primary education is the function of prov. and dist. authorities. Secondary education is a function of the Ministry of Education. Each prov. is in the hands of an education commissioner, but in three provs. the univ. dist. system prevails. These are the Central Univ. dist. (Kiangsu, Peiping Univ., and Hang-

chow Univ. (Chokiang), where the head of the univ. governs the affairs of each prov. Foreign and missionary education is mostly influenced by America. As a result of America's generous remission of a large part of the Boxer indemnity, the Hsing Hua College was built in 1911 for the purpose of training students who are eventually to continue their studies in the U.S.A. Another Amer. foundation is the Rockefeller Hospital, to which is attached the Peiping Union Medical College. The former literacy average of 1 per cent of the whole pop. had risen to 15 per cent by 1930, being much higher in some provs. In the three years 1939-41 some 4,000,000 persons were taught to read and write. It was estimated that this number would exceed 19,000,000 by the end of 1945.

Religion.—Three religions, Confucianism (if it may be called a religion), Buddhism, and Taoism, are officially recognised by the Chinese Gov. Confucianism is a moral system which definitely refuses intercourse with the unknown, and emphasises the duties of the present life. Confucius (K'ung Fu-tzu) encouraged ancestor-worship as a part of filial piety, but he himself is not worshipped as a god. At the present time there is a reaction against his teachings, which uphold feudalism and the family, as being unprogressive. Confucianism makes for extreme courtesy. Taoism, taught by Lao-tze, an older contemporary of Confucius in the sixth century B.C., is a refreshing rationalistic philosophy. Later it degenerated into magic, concerned with the search for the elixir of life. Buddhism entered C. in the first century A.D., and thence spread into Tibet, where in the form of Lamaism it now has its stronghold. Mohammedanism was introduced in the seventh century A.D., and spread with such success that there are now 50,000,000 adherents of this faith in C. (including Manchuria). A large native literature has grown up around it. Christianity was introduced by the Nestorians at the beginning of the sixth century, but died out after flourishing for a short time. In 1247 the first Catholic missionary, Friar John of Carpini, entered C., and in 1581 the Jesuit Friar Ricci made many converts. The Rom. Catholic faith has now 1,250,000 adherents, while Protestantism has about 400,000. Christianity suffers in the eyes of the Chinese owing to the variety of sects which have missionary headquarters in C. The Chinese do not tolerate a paid priesthood. Most of the aboriginal hill tribes are still nature worshippers, and ethnically are distinct from the prevailing Mongoloid pop.

History.—No trace is found in anct. Chinese literature of any tradition on which a theory might be founded as to the original source of the race. The Chinese have their own traditions as to the hist. of the human race, and this shows no signs of any migration. After the time of P'an-ku, the first man, they tell of ten periods of sovereigns, to the reigns of whom most of the great advances in civilisation and culture are assigned. The first emperor of whom a detailed

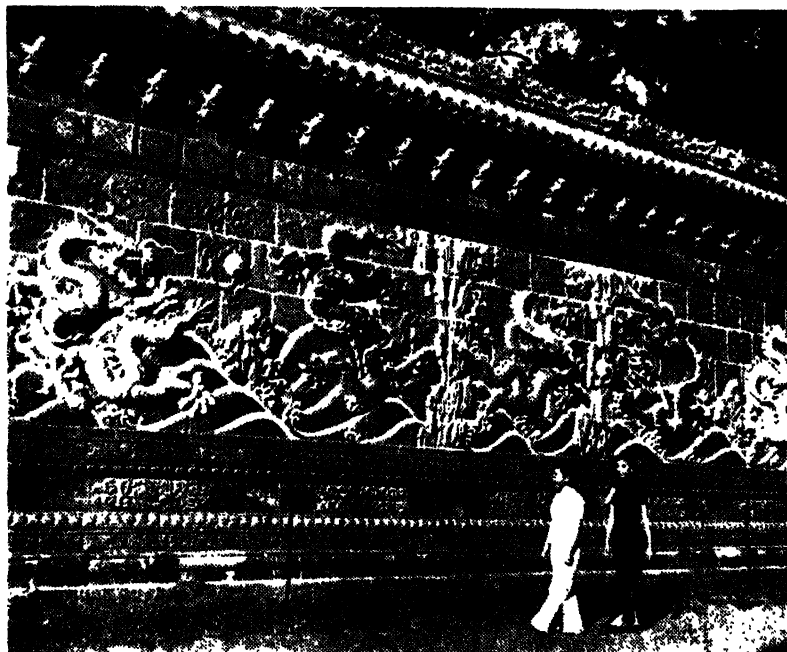
account is given is Fu-hsi, whose lifetime tradition fixes as 2852-2738 B.C., but he is regarded by many as a supernatural and semi-human being. Following him, and forming with him the group known as the Three Emperors, come Shun-nung and Huang-ti, carrying the story down to the twenty-fourth century B.C. Immediately following come Yao and Shun, who are regarded by popular Chinese hist. as types of perfect emperors. On their heads are heaped up piles of virtues, all, apparently, of late origin. In 2205 B.C. begins the Hsia dynasty, of which the first emperor, Yu, came to the throne as successor to Shun on account of his engineering ability. This dynasty is supposed to continue till 1766 B.C., when Kie, the eighteenth emperor, a type of the bad king, was overthrown, and the Shang dynasty commenced. This also began well with its first sovereign, Ch'ung-Tang, but gradually degenerated until it ended with the contemptible tyrant Chou-hsin in 1123 B.C. With the next dynasty we begin to reach the grounds of true hist. The period of the Chou dynasty forms, indeed, one of the classical epochs of Chinese hist. Wu-wang, the first emperor, aided by his brother, Chou-kung, set to work to weld the disunited members of the country into a solid whole. In doing this he made use of a system which we must describe as feudal. He brought peace and prosperity to the whole land. Agriculture improved, everywhere great public works were constructed, the nomadic life came to an end, and the foundation of the political system was laid. Literature and the arts flourished during the whole Chou period. The emperor was regarded as the son of heaven, and became the mediator whom the people revered as representative of heaven, and who at the same time sacrificed and acted as high priest for the nation. The outlines, at any rate, of the reigns of the thirty-five sovereigns of the Chou dynasty are correct, and it is probable that the details are also mostly trustworthy. One, at any rate, has been tested. The record is given of an eclipse which occurred in the reign of Yu-wang, and astronomers have calculated that the date given for this is perfectly accurate. The date of the eclipse, Aug. 29, 776 B.C., is, however, generally considered as the first certain historical point in Chinese hist. During the century immediately following, disintegration set in, and the kingdom fell into five states, the period being known as that of the Five Leaders. The fortunes of each state varied considerably year by year, but the state of Ts'in, on the W. border, generally remains the most prominent. This was followed by a period of still greater anarchy and internecine strife known as that of the Contending States. In the midst of this disordered time come the three great Chinese sages, within a century or two of each other. First comes Confucius, b. 551 B.C., the first historian of his country. It was he who united all the traditions of gov. and conduct handed down through the ages, and welded them into the system

of morality which his country has preserved since. He lays particular emphasis on the centralisation of authority, that being a particular need of his age. The father has absolute authority over his family, and the emperor is the father of the State. Lao-Tsze (Laocius) (*q.v.*) and Mencius also belong to this period. The Chou dynasty was now very weak, and the influence of Confucianism was not strong enough to secure unity. The king of Ts'in made war upon the Emperor Nan-wang, and with him the Chou dynasty ended in 256 B.C. For a time there was no emperor, but in 249 B.C. the Ts'in dynasty, from which the name of C. is derived, had its beginning. Chwang-siang-wang, the nominal founder of this dynasty, d. in 246 B.C., and was succeeded by Shi Hwang-ti, the first of the 'universal emperors.' This emperor set himself to do away with the feudal system, and to do this he beheaded some hundreds of the scholars, among whose ranks the system found its chief supporters. To him is attributed the building of the Great Wall, and he is also said to have made many canals, etc. For many centuries the Chinese had been engaged in warfare with the Hsueh-nu, probably connected with the Huns, and Shi Hwang-ti led a successful expedition against this tribe, driving them into Mongolia. He also extended the empire southward as far as the Yangtze-kiang. On the failure of the Ts'in dynasty, war broke out between Liu Pang and Hsiang-Yu, two leaders of the successful rebellion which had brought this about, and the former prince came to the imperial throne under the title of Kao Ti (*c.* 206 B.C.). He was the founder of the Han dynasty. After this period the Chinese political system never acquired any stability, and during the centuries that follow no less than thirty-five dynasties are chronicled, not one of which lasted for more than three centuries. The period of the Hans was one of great progress. Shi Hwang-ti, in his enmity against the literate classes, had ordered the destruction of all the books, except those on ordinary sciences, and an effort was made to repair the effects of this wholesale destruction. The system of competitive examinations, which lasted until the nineteenth century, was now instituted. Except for successful campaigns with the Hsueh-nu, the empire remained at peace.

In the reign of Wu-ti (140-86 B.C.) the power of the Tartar marauders was broken, and E. Turkestan was made subject to the emperor. Many states on all sides were also absorbed, and the Han period ranks as one of the greatest epochs of Chinese national prosperity and expansion. The Chinese—especially those of the N.—still rejoice to call themselves the 'sons of Han.' To this dynasty, which ended in A.D. 220, succeeded an epoch of misrule and disturbance, that of the Three Kingdoms, which lasted for forty-five years. Then the dynasty of the W. Tsiu was estab. by Sz-ma Yen, who took the title of Wu-ti. To this succeeded a chaotic period under the E. Tsiu, which family lost power in 419. This period is

notable for the reception at the Chinese court of an embassy from the Rom. empire, which was then sharing with the Chinese the menace of the Tartar hordes. For two hundred years after 419 almost all trace of ordered gov. was lost. No less than fifteen dynasties succeeded to the throne during this period. In 618 Li Yuen, taking the name of Kao-Tsu, made himself the first emperor of the great

960, the Sung dynasty, was far greater. Between these two (907-60) come five minor dynasties. This is, above all, the period of C.'s literary activity. Book-making, printing, and the formation of libraries were actively carried on throughout the country. The chief adversaries of the empire during this period were the N. Khitán Tartars. The first three kings, T'ai-tsu, T'ai-tsung, and Chou-tsung,



New York Times Photos

THE KIULING OR NINE DRAGON WALL IN PEIPING

This wall of coloured tiles was built during the Liao era (916-1125) by a member of the Manchu dynasty from Jehol who seized the throne. The relief work in five bright colours shows nine dragons leaping energetically over waves to catch a bouncing ball. The dragon was the symbol of Chinese dynasts, the ball, the sun, signifying the reins of power

T'ang dynasty. The three hundred years which followed, to its fall in 907, were years of great expansion and progress. At first the power of the Turks on the W. was so great that they had to be propitiated, but it was not long before aggressive measures could be taken, and the frontier was greatly extended in their direction as far as E. Persia and the Caspian Sea. From every part of Asia ambas. were received at the Chinese court. Later the frontier was also extended on the N. to the borders of Korea by the defeats inflicted on the Khitán. At the end of the eighth century the T'ang dynasty began to decline, but that which succeeded it in

carried on a campaign against them with gradually declining success, and the Chinese were finally compelled to call in the aid of the Nüchih Tartars to expel the Khitán from Liaotung. This the Nüchih did, but they then refused to leave the country they had thus occupied. They took the offensive against the Chinese and ultimately possessed themselves of the whole of N.C., over which they estab. the Kin dynasty, leaving only the S. half to the Sung. Meanwhile, the power of the Mongols in E. Asia was increasing, and it was the N. kingdom that first felt the approach of the new danger. In alliance with the Khitán, Genghis Khan, the great

Mongol leader, invaded Liaotung and captured the cap. city, Liaoyang, in 1212-13. The war continued with Mongol victories until the death of Genghis in 1227. He was succeeded by his son, Ogdai, who made an alliance with the Sung of S. C. against the Kins. This alliance was successful, and the Kin dynasty was entirely swept away. Quarrels, however, then arose between the allies, and the Mongols swept over most of S. C. The whole of the country was in their hands when, in 1259, Kublai Khan ascended the Imperial throne. At no period did C. attain such greatness as now, under the Mongol dynasty. Its ters. extended from the Dnieper to the Pacific Ocean, and from the Arctic Ocean to the Straits of Malacca. Commerce flourished even with Europe, and it was during this period that Marco Polo, the first European to give the W. races an accurate idea of C., was in the service of the Great Khan. In 1368 this great dynasty was succeeded by the native Ming dynasty, famous rather for the arts of peace than for their conquests. They, also, strove to encourage intercourse with foreign nations, and many Portuguese and Sp. traders entered the country. Christianity was also introduced more extensively by the exertions of the Jesuit, Father Ricci. Canton became the chief port for foreign intercourse. But new foes, the Manchu Tartars, were now coming into prominence. In 1616 a force of these people, who had suffered much from Chinese oppression, entered the country and defeated the forces sent against them. In 1619 they took complete possession of Liaotung, and in the following year T'ien-ming, the Manchu king, declared himself independent. Meanwhile, C. itself was in a state of disunion. There were various rebel forces under different leaders, in arms against the emperor, who finally committed suicide. None knew where to turn for help, and the general on the Manchu frontier invited the Manchus to enter and subdue one of the rebel leaders. They willingly did so, but refused to retire when their work was done. They took possession of the cap. without a struggle, and in 1644, the last dynasty of C., the Ta-t'ing, or 'Great Pure,' was estab. It is interesting to note that the pig-tail, the plaited queue of hair worn at the back, so often considered a special mark of the Chinese, dates its introduction from this time. It was imposed on them by the Manchu conquerors, whose fashion of head-dress it was, and at first was received most unwillingly. However, the Manchus were in the minority, and most of their customs, etc., were replaced by those of the conquered race. Perhaps the greatest of the Manchu emperors was the second, K'ang-hi (1662-1722), who is famous both for learning and for generalship. He devoted himself to study under the guidance of the Jesuits, and it is to him that the country owes the great dictionary of the Chinese language. His successor, Yung Cheng, was a monarch of a very different type, and it is from his reign that the policy of 'exclusion' clearly begins. He

inaugurated a persecution of Christians, and did his best to undo the work which the Mongol emperors had started. The change was not, however, due to him alone. The conduct of Portuguese traders, and the quarrels of the religious orders had not impressed the Chinese favourably. Moreover, the ideas of civilisation entertained by the E. and W. races thus brought into contact were diametrically opposed on many points. Collision followed, as it was bound to do. From the seventeenth to the nineteenth century the attempt of C. to retire within herself and exclude the 'barbarians' marks her hist.

It is time now to turn to England, for to her is due the opening of C. to Europe. Eng. trading with C. began in 1635, and for nearly two centuries the Eng. trade was in the hands of the E. India Company. The Chinese objected especially to the importation of opium, and the bringing in of this drug was made illegal in 1796. Mutual distrust between gov. and traders had long been growing, and in 1837 the Chinese Gov. resolved on finally exterminating the opium trade. A governor, Lin, was sent to Canton, with orders to compel the merchants there to give up all the opium in their possession. The Eng. were in a weak and precarious position, and the demand was complied with, but Elliott, the Brit. governor, refused to take the further step of signing a bond authorising the confiscation of all ships afterwards engaged in the trade. Negotiations continued for some time, which terminated with the Brit. Gov.'s declaration of war in 1840. The Brit. captured Chusan, stormed sev. cities, and finally threatened Nanking. A treaty was then made at the latter place by which five ports, Canton, Amoy, Foo-chow, Ningpo, and Shanghai, were opened to Brit. trade; Hong Kong was ceded to Britain, and a large war indemnity was paid. Various other questions were also settled, but not that of the opium trade.

In 1856 fresh complications arose, over the 'Arrow' affair, and a fresh war arose. In this France joined, and after some victories by the allies the war closed in 1858 with the treaty of Tientsin. The Brit. then aided the Chinese to put down the famous Tai-ping rebellion. Till the end of the century the Chinese were engaged in resisting the encroachments of the Russians in H., of the Jap. in Formosa and the Liuku Is., and of the Fr. in the S. Meanwhile Korea, nominally under the suzerainty of C., was threatening to prove the cause of a war with Japan, owing to the encroachments of the latter power, and in 1894 this actually came. After a year of conflict the Chinese signed a treaty at Chifu (1895), in which the independence of Korea was recognised by C., and Formosa and part of the Liuku archipelago ceded to the conquerors. At this period many new treaty ports were opened to the W. powers, who aided the Chinese in return to eject the Jap. from Liaotung. C. then set to work vigorously to reorganise her military system. In 1897 Germany seized the port of Kiaochow, and in the following year C. granted the

Gers. a lease of this dist. for ninety-nine years. In the same year (1898) Russia also received the lease of Port Arthur and its dist., while Britain received Weihaiwei, and a ninety years' lease of part of Kwangtung. France received the lease for a similar time of the bay of Kwangchowwan and of the is. near the bay. These predatory proceedings brought in their train a natural reaction against foreigners, a reaction which culminated in the Boxer rising (1900) (*see* BOXERS, THE). In Feb. 1904 Russia and Japan came into collision over the question of Korea, and in a series of engagements, all of which occurred in Manchuria, Korea, or on the Chinese seas, Russia was severely beaten (for details *see* RUSSIA). Throughout this war C. remained a passive spectator. The terms of the treaty of Portsmouth, U.S.A., which was signed on Aug. 29, 1905, in so far as they affected C., included the conveyance of the lease of Port Arthur and Dairen (Dalny) to Japan and the recognition by Russia of Korea and S. Manchuria as being within Japan's "sphere of influence." Korea was finally annexed to Japan on Aug. 23, 1910, and the annexation was not questioned by the powers. In estimating the factors which led up to the revolution of 1911-12 (perhaps the greatest revolution the world has yet seen if the number of people it affected be taken into account), the weakness of the Manchu court must be borne in mind. The weak and youthful emperor, Kwang-su, made an abortive attempt in 1898 to introduce administrative reforms. This at once led to the reins of gov. being seized by his aunt, the reactionary and aged dowager empress, the emperor being made a prisoner in everything but name. There is little doubt as to the complicity of the dowager empress in the Boxer rising, but even she was forced to make some concession to the forces of progress within the empire. Edicts were issued in which constitutional reforms were promised, such reforms to be effected gradually, the whole to be completed by 1917. On Nov. 14, 1908, the Emperor Kwang-su died, and strangely enough on the following day the dowager empress also died. The emperor, who had died childless, was succeeded by his infant nephew, Pu-yi (*b.* Feb. 11, 1906), who was not quite three years of age, Prince Chun, his father, being appointed regent. Prince Chun was a man of enlightened character, but even he was not able to withstand the court influences working against progress, so that before the new monarch had reigned two months Yuan Shih-kai, the able and reforming viceroy of Chih-li, was dismissed. With Yuan's departure went possibly the only man who could have staved off the impending revolution. The storm burst on Oct. 10, 1911, on the banks of the Yangtze, a dist. in which insurrections seem to be endemic. The rising in Hankow in the prov. of Hupeh was joined by the modern-drilled troops at Wuchang, near Hankow. The neighbouring arsenal of Hanyang was captured and with it funds to the extent of 4400,000. The movement, which was more anti-

dynastic (*i.e.* anti-Manchu) than republican, rapidly spread, and soon embraced most of the S. provs. of C. The leader of the revolt at Hankow was the able general, Li Yuan-hung, but the inspirer of the revolution was Dr. Sun Yat-sen, at that moment in America. The distraught Central Gov. on Oct. 14 sent for Yuan Shih-kai, who at first refused to come to its aid, but eventually did so on the court conferring on him dictatorial powers. He dispatched Adm. Sa Chen-ping up the Yangtze with a squadron of gunboats, and proceeded to quell the rebellion at the head of the still remaining (mostly N.) loyal troops. On Oct. 13 the rebels proclaimed a republic in the prov. of Hupeh, with Li Yuan-hung as president, and notified the foreign consuls that the property and persons of foreigners would be respected. After some indecisive fighting around Hankow in which the advantage lay first with the rebels and then with the imperialists (Hankow being recaptured and burned on Oct. 29), a truce was arranged. In the meantime a rebel gov. was estab. at the old cap. of C., Nanking, and a convention representative of all the S. provs. was assembled first at Shanghai and later at Nanking. Dr. Sun Yat-sen duly arrived in C., and Yuan Shih-kai secured from the royal house in the closing days of 1911 an edict pledging itself to abide by the decision of a national convention as to whether it should abdicate or not. The revolutionaries now demanded that the Manchu dynasty should abdicate and a republic be estab., but Yuan strove hard to bring about a constitutional monarchy only. He sent Tang Shao-yi to negotiate with Wu Ting-fang (formerly Chinese ambas. at Washington), and Tang was apparently won over to the republican point of view. On the other hand, Dr. Sun Yat-sen, who had been elected president of the republic by the Nanking Convention, by an act of patriotic self-effacement which saved much bloodshed, refused to accept the position, and urged that Yuan Shih-kai be appointed. Seeing that further resistance was useless, Yuan set himself to the task of making the change from the old regime to the new with as little friction as possible, and sought to procure the most face-saving conditions for the retiring dynasty. On Feb. 12, 1912, the throne issued three edicts, in which it announced its will to abide by the decision of the National Convention and accept the republic, entrusting Yuan with the task of bringing about the new constitution in conjunction with the Nanking gov., and, after exhorting all to peaceably accept the new order, announced the abdication of the dynasty. A constitution of seventy clauses was promulgated; the emperor was to retain his title and receive a pension, and be accorded the civility due to a foreign sovereign. On Feb. 27 the Nanking Assembly endorsed this decision by electing Yuan as president, and he was formally installed on March 10, but for a long while there was a deadlock over the question whether Peking or Nanking should be the cap. of the republic, the

question not being settled in favour of Peking until April. Tang Shao-yi, who subsequently resigned, was appointed premier, Li Yuan-hung vice-president, and a Cabinet drawn from both govts. was constructed. The National Assembly met in Peking in April 1913, and censured Yuan Shih-kai for negotiating a foreign reorganisation loan. Foreign capital in C. has led to the system of extra-territoriality, granting of concessions, etc. Conflict between Yuan and Sun Yat-sen resulted in the second revolution in July. Sun fled to Japan, and in Oct. Yuan was elected full president for five years. His first act was to dissolve the Kuomintang and expel its members from Parliament. The Kuomintang originated with the youth movement. In 1894 Sun founded the Shing Chung Hwei (C. Revival Society), which gained many supporters owing to the feeling aroused by the 'unequal treaties' contracted between the powers and the enfeebled Manchu Gov. In 1905 the society was reorganised, and in 1911 was called the Kuomintang (People's National Party). From 1913 to 1916 the party showed no activity beyond secret propaganda against Yuan's monarchical ambitions. In 1914 America proposed an agreement to neutralise the Far E. Japan took exception and, following an ultimatum to Germany, attacked the Ger. leased ter. of Kiaochow and, on Nov. 7, 1914, captured Tsingtau. Japan also occupied Chinese dists. in Shantung, thus violating Chinese neutrality. Protests were met by the notorious Twenty-One Demands, which meant the control of C. by Japan. Contrary to Japan's wishes, Yuan pub. the negotiations, raising such protest, especially in America, that Japan modified the demands. An ultimatum forcing acceptance of these was delivered to C. on May 7, 1915. Yuan attempted to restore the monarchy, with himself as emperor, but widespread revolt caused him to abandon his ambition. On June 6 he died and Li Yuan-hung became president. In a dispute with the premier, Tuan Chi-jui, over C.'s participation in the First World War, Li called in Gen. Chang Tsun as mediator. Chang's first act was to dissolve Parliament, and many members left Peking to form a constitutional gov. at Canton under Sun Yat-sen. On July 1, 1915, Chang restored the Manchu ex-emperor, but was defeated by Tuan Chi-jui at the head of the N. army, and the emperor was again deposed. Li Yuan-hung resigned, and Feng Kuo-chang became president. Tuan Chi-jui was again premier, and war was declared on Germany and Austria on Aug. 14, 1917. The revolutionary gov. at Canton also declared war. In Aug. 1918 the war-lords or *tuchuns* assembled the 'bogus' Parliament and elected Hsu Shih-chang as president. At the Versailles peace conference C. was represented by delegates from both the Peking and Canton Govs. France and England were bound by secret treaty to support Japan's claims to the former Ger. ters., and Shantung was accordingly awarded to Japan by the Council of Three, April 30,

1919. Thereupon the Chinese delegates refused to sign the treaty of Versailles. Anti-Jap. riots broke out in C., and the militaristic party, supposedly subsidised by Japan, became so unpopular that Tuan Chi-jui formed the Anfu party to consolidate his position. He was opposed by Tsao Kun, the Chihli *tuchun*, and Wu Pei-fu, the Fengtien *tuchun*. The president, prompted by the 'Anfu party', dismissed Wu on July 9, 1920, and censured Tsao Kun. Joining forces with Chang Tso-lin, the military governor of Manchuria, they moved against Peking. Meanwhile in April the Canton Gov. had split, and Sun Yat-sen with two other leaders negotiated from Shanghai with Tuan Chi-jui at Peking for the unification of the country. In July Tuan was decisively defeated by Wu Pei-fu, and retired to a Buddhist monastery. Power in the N. now belonged to the super-*tuchuns*, Chang Tso-lin and Tsao Kun. The year 1920 ended with a famine which reduced 15,000,000 to starvation. In 1921 Sun Yat-sen returned to Canton, and in April was unconstitutionally elected president.

On Nov. 11, 1921, the Washington Conference met to discuss the limitation of armaments and incidentally the question of Shantung and the Far E. A compromise was reached over the management of the Shantung railway, and it was agreed to restore to C. all public property in Tsingtau. By 1923 C. was in possession of all former leased ters. at Kiaochow. Other Chinese demands for tariff autonomy and the abolition of extra-territoriality were favourably received. England proposed to restore Weihaiwei, and the agreement was eventually signed on April 18, 1930. A commission, empowered at Washington to investigate extra-territoriality, suggested in their report (1926) a progressive scheme for the elimination of foreign jurisdiction in C. In 1929 an exchange of notes took place between the Nationalist Gov. of C. and the interested powers re extra-territoriality. In April 1922, Sun Yat-sen, president of the Canton Gov., and Chang Tso-lin, dictator in Peking, made an alliance to suppress Wu Pei-fu. Wu, aided by the 'Christian' general, Feng Yu-hsiang, defeated Chang and, forcing Hsu Shih-chang to retire, he reinstated the former president, Li Yuan-hung. At this time Russia tried to restore diplomatic relations with C., but Joffe, the Soviet envoy, agreed to mutual co-operation with Sun Yat-sen. Sun was in exile at Shanghai owing to conflict between the Kuomintang and the Kwangsi military party, but on Feb. 21, 1923, he returned to Canton and formed a military gov. The constitutional Parliament, however, in force in Peking, should have had Sun's co-operation. Karakhan, who was in Peking in Sept., restored relations between Russia and C., relinquishing all Russian extra-territorial rights. Sun reorganised the Kuomintang, and at the first national congress, held in Jan. 1924, issued the celebrated manifesto which became the foundation of the National Gov. Sun had based his constitution on that of

Great Britain and the U.S.A., hoping for their support, but after the Hong Kong strike in 1922 none was forthcoming, and in 1924 he turned to Russia. Borodin came to Canton as Soviet representative. The Kuomintang was a revolutionary, not a communist, party, but after the 1924 reorganisation members of the Chinese Communist party were admitted. The Chinese Communist party, beginning as a secret society in 1920, consisting of students and intellectuals, intensely idealistic, had grown rapidly, but Sun in advocating co-operation with the Communists did not subscribe to their principles. Meanwhile the N. militarists were plotting for the overthrow of Tsao Kun, the president. Wu Pei-fu undertook a campaign against Chang Tso-lin, but he was deserted by Feng Yu-hsiang. Feng entered Peking on Oct. 22, 1924, and imprisoned Tso Kun. In Nov. Chang and Feng persuaded Tuan Chi-jui to return to Peking as chief executive. Sun was invited to a conference, but arrived in Peking an ill man. On March 12, 1925, he died and his death caused a split in the Kuomintang. One section, the W. Hills group, estab. separate headquarters at Shanghai, whereas the Canton section became more communistic. Various disturbances in S. C. culminated in the Shameen Incident, when the Canton foreign concessions were fired on by Chinese students. This incident put Wang Ching-wei, left wing leader of the Kuomintang, in control of Canton. Meanwhile a Kuomin army had been formed by Chiang Kai-shek, head of the Whampoa Military Academy. Forty Russian instructors, ex-officers of the Red Army, had been engaged by Sun to teach in the academy. Borodin continued as adviser to the Central Executive Committee of the Kuomintang, but during his absence in March 1926 Chiang succeeded in expelling the Russians and other Communists, including Wang Ching-wei, from Canton. On Borodin's return in April, however, Chiang drove his anti-communist colleagues from office. On June 11 he became commander-in-chief of the Nationalist Army, and began his campaign against the N. By July Changsha was taken, and by Aug. the borders of Hupeh were reached. The N. war lords Sun Chuan-fang and Wu Pei-fu failed to unite, owing to jealousy, and Wu was defeated. Hankow was captured and renamed Wuhan. On Dec. 6 the Nationalist Gov. arrived there from Canton. The Communist party was still predominant, with Borodin as adviser, but the most outstanding man was Eugene Chen, the minister of foreign affairs, a man held in respect by all parties. Chiang Kai-shek was not anti-Communist, and after the defeat of Sun Chuan-fang he estab. a rival gov. at Nanchang. The march of the Nationalist armies had been prepared by propaganda, and on Jan. 3, 1927, anti-foreign feeling culminated in the attempt to seize the Brit. concession at Hankow. The concession was defended by marines, but no shot was fired and no lives were lost. Negotiations followed between Eugene

Chen and O'Malley, the Brit. representative. The Brit. Gov. had adopted a new conciliatory policy towards C., and it was proposed to put the concessions at Hankow and Kiukiang under Chinese administration. Negotiations went forward favourably, but on Jan. 24 a Brit. expeditionary force of 20,000 men, with tanks, aeroplanes, and artillery arrived in Shanghai. Shanghai was in danger from the fighting between Chiang and Sun Chuan-fang, but this precautionary measure to protect Brit. nationals so exasperated the Chinese that Eugene Chen broke off negotiations. They were resumed later, and on Feb. 19 the Chen-O'Malley agreement was signed. The S. armies took Shanghai on March 22, and two days later entered Nanking. Although Chiang's armies had a reputation for orderly behaviour, a body of armed men began systematic looting of foreigners' houses. Seven foreigners were shot, and others, including the Brit. consul-general, were wounded. A party of 150 were eventually rescued under cover of a barrage from Brit. and Amer. warships. These Nanking outrages were the result of a Communist plot to discredit Chiang Kai-shek with the foreign powers. Chiang referred the powers to Nanking for their indemnities, and on April 15 himself ordered a clean-up of Communists in Canton with 2000 arrests and 20 executions. Previous to this the Hankow Gov. had tried to undermine his command in the army, and Chiang set up the rival Nanking Gov. He started the so-called purification movement and prosecuted the trades unions of Shanghai, with whose aid he had taken that city. In Peking Chang Tso-lin, who had maintained his authority since 1926, also started a Communist prosecution. The Hankow Gov. then began a military drive northward, hoping to take Peking in three months with the help of Feng Yu-hsiang, who had declared for the Nationalist cause. A three-cornered contest ensued, in which the Nanking and Hankow Govs., although both nominally Nationalist, were divided on the issue of Communism, but were allied against Peking. At the same time, Chiang in Nanking and Chang in Peking were both anti-Communist. With Chiang hostile on the right flank and Chang and Wu Pei-fu with armies to the N., the Hankow Gov. was practically isolated. Tang Shen-chih began the march against Peking on April 22, hoping to join with Feng, who was in Shensi with the Kuo-min Chun or People's Army, drilled with the fanaticism of a Cromwell. Hankow was itself beset by a Nationalist general of Chiang Kai-shek's faction. The gov. would have fallen had not its troops gained a victory at Chumatiien and taken Chenchau. Feng controlled Homan, while Tang returned to defend Hankow. The severe losses at Chumatiien, however, indefinitely delayed the attack on Peking. Meanwhile Chiang was conducting his own campaign against Peking, and in June invaded Shantung. Fifteen hundred Jap. troops suddenly occupied Tsinanfu, and Tsingtao was similarly garrisoned. The

pretext was the protection of nationals, but Japan was interested in maintaining the supremacy of Chang Tso-lin. On June 18 Chang counter-attacked Chiang Kai-shek, who was also harassed by Sun Chuan-fang's renovated army. Being defeated, he retreated to the Yangtze, narrowly avoiding being outflanked by the Hankow troops. Hankow had declared war on Nanking in July 9. Chiang was hemmed in on three fronts, as Feng, who had been keeping the balance between Nanking and Hankow, joined with Hankow. However, the difference between the two govts. was beginning to disappear. Members of the Kuomintang at Hankow became dissatisfied, as it appeared that Borodin was pledged to betray the gov. into a more violently communistic regime, presided over by the Chinese Communist party. On July 17 Ho Chien, a Nationalist general, taking advantage of the Hankow forces being engaged against Nanking, descended on and effected a *coup d'état*. Eugene Chen was expelled, and later left C. for Moscow. There was a general exodus of Chinese and Russian Communists. Miao Sun publicly proclaimed at Moscow that Sun Yat-sen's work was betrayed into the hands of the militarists, and that the revolution was finished. The only obstacle now hindering the reunion of Hankow and Nanking was the person of Chiang Kai-shek, and he resigned on Aug. 12, 1927. The Hankow and Nanking forces were then free to make a combined attack on Sun Chuan-fang, who was decisively defeated. Nationalist control was estab. S. of the Yangtze, and the Sept. Nanking Gov. was organised by the reunited Kuomintang. Nanking became cap., having no foreign concessions and being near Shanghai. The gov. in renouncing the workers' and peasants' associations looked to the Shanghai bankers for support. Union did not last long. The left wing leader, Wang Ching-wei, refused to co-operate, and set up a gov. at Canton. Chiang Kai-shek returned to Shanghai from Japan in Nov., and acted as mediator between the left and right wings of the Kuomintang, which it was hoped to unite for the fourth plenary session. In Dec. Canton was sacked during a Communist insurrection. A reaction followed. Wang Ching-wei, becoming discredited, left for Europe, but the Kuomintang was no nearer reunion. In Jan. 1928 the Nanking gov. again offered Chiang the command of the army and the leadership of the revolution. He tried to stabilise the gov. in order to continue the N. campaign, and on Jan. 7, 1928, the Third Nanking Gov. was organised. Its manifesto was based on Sun's Three People's Principles, but all connection with Soviet Russia was severed. T. V. Soong was appointed minister of finance. He had the confidence of the Shanghai bankers, and a loan was floated to subsidise the N. campaign. In March the expedition started. Chiang was allied with Feng Yu-hsiang and Yen Hsi-shan, and the common enemy, Chang Tso-lin, was routed. The Jap. again rushed troops to Tsinanfu. Chiang's ad-

vance was checked, and skirmishes between Jap. and Chinese were inevitable, but more serious consequences were avoided by Chiang's prudence. The implication that Chang Tso-lin was being indirectly aided by Japan broke the morale of the N. resistance. Chang evacuated Peking, and, while en route for Manchuria, was blown up and killed.

The Peking Gov. was at once, Peking, which means N. cap., was renamed Peiping, which means N. Peace. According to his promise, Chiang resigned his command, but received it back again. Personal animosity existed between the three generals of the S. armies, but the military problem was really a financial one, which T. V. Soong endeavoured to solve at the important economic and financial conference, held in June. Chiang arrived in Peiping on July 3 to attend the memorial service of Sun Yat-sen, and at a meeting of military commanders he pressed for disbandment. Later in July Chiang and Feng were in Nanking for the fifth plenary session. Feng was disaffected, but he accepted the Ministry of War, a post which held him in Nanking. The party dictatorship of the Kuomintang inaugurated the period of political tutelage which was to succeed militarism. At the fifth plenary session the Organic Law of the National Gov. was drawn up. This was the basis of the ensuing Five-Power Gov., with its decentralised authority, a system familiar to the Chinese, and therefore more stable than the Soviet system. The old mandarin was replaced by a civil servant trained in W. methods. The chief problem confronting the National Gov. was now a military one, which in its financial aspect meant a burden of taxation. Chiang wished to create a strong national army out of the existing troops, and to disband and industrialise the remainder. He sought the help and personal advice of Bauer, a Ger. colonel. This man earned Chiang the jealousy of other commanders, notably Feng, who issued manifestoes criticising the gov. and ridiculing his colleagues. Chiang Hsueh-liang, governor of Manchuria, acceded to the central authority, and this gave Chiang the opportunity to call a disbandment conference in Jan. 1929. He met with no support, and the failure of disbandment brought renewed civil war. In Feb. Feng left Nanking to join his army, wishing to control Shantung as soon as the Jap. evacuated. At the same time the Kwangsi party, the Fourth Army group at Hankow, became disaffected towards Chiang, and made war on Nanking. Feng failed to co-operate, and Chiang's alertness destroyed the Kwangsi forces. Chiang had made overtures to Feng, promising him Shantung, but at the conclusion of the Wuhan or Hankow campaign the Nationalist control of Shantung proceeded. Feng was now openly hostile to Chiang, who, in asserting the authority of Nanking, was virtually dictator. In March the Kuomintang convened the Third Party Congress, but although it strengthened the administration of the

gov., it failed to find a sound financial policy. In the N. dissatisfaction with the gov. was aggravated by famine. Feng declared a revolt of the Kuomintang, and being deprived of his offices and dismissed the gov., he was in the position of an independent militarist. Two of his generals, however, maintained their allegiance to the National Gov., while Yen Hsi-shan, who had been the third of the former triumvirate, with Feng and Chiang, came forward as Feng's champion. No actual fighting occurred until after the state funeral of Sun Yat-sen in Nanking. At this function the representatives of foreign powers gave the Kuomintang an international prestige. In June Feng retired to Shansi, where Yen was governor. Yen advised him to go abroad, and offered to go with him. Chiang could not accept Yen's resignation, as the N. would have become disorganised. He himself went to Peiping, thus asserting the authority of the Gov. throughout C., but he found the N. 'reorganised' in sympathy. Wang Chiang-wei, Chang Fat-kwei, and Feng had formed an anti-government faction, called the Reorganisationist party, after the Third Party Congress, which they declared illegal. Yen was claimed as an ally by both sides. On Sept. 22 Chang Fat-kwei began a march on Canton, and in Oct. Feng sent a 'punitive expedition' against Nanking. Meanwhile in Manchuria trouble was developing over a dispute which began in July, when the Russian manager of the Chinese E. railway was dismissed by the Chinese, following a police raid on the Soviet consulate. A state of war existed for some months, until on Dec. 22 the Chinese acceded to the Russian demand for a restoration of the *status quo ante*. While the Manchurian trouble was at its height, Chiang was forced to compound with Feng, who retired, leaving the Nationalist forces to occupy Loyang. Chang Fat-kwei was still threatening Canton, but was repulsed on Dec. 9. The year closed with a mandate issued by the Nanking Gov., abolishing extra-territoriality as from Jan. 1, 1930. In the N. the hegemony of Nanking was resented, and in March Yen Hsi-shan allied himself with Feng and seized control of Peiping. Wang Chiang-wei, the left wing advocate of reform, was expelled from the Kuomintang. In May civil war broke out between the N. and S. and in July resulted in a stalemate.

Events in China in the Decade before the Second World War.—Chang, ostensibly neutral, had seized the occasion to extend his gains southward to the Yellow R. and to sell munitions to both the Nationalist Gov. and its opponents of the N. coalition. Chiang Kai-shek, whose occupation of Hopei and Shansi had enabled him to defeat the coalition leaders, found it expedient to acquiesce in Chang's usurpations and indeed to entrust him with the pacification of the country N. of the Yellow R. But in 1931 came the Jap. military offensive in Manchuria, an event which prompted an overwhelming wave of nationalism, compelling the resignation of Chiang Kai-shek. His political

difficulties had been aggravated by the Communists, against whom he was forced to launch a heavy offensive from Nanchang in Kiangsi at the very moment when a minor revolt against him and Chang had broken out under the N. generals, who thereby exemplified the characteristic tendency of Chinese military and civil leaders constantly to intrigue against each other for their own private gain. But towards the end of 1931 the reorganised Nanking Gov. recognised that their chief problem was to alleviate the condition of a hard-pressed peasantry in a bandit-infested country. Chiang Kai-shek retained his military power by means of alliances with loyal generals of sev. provs., while effective authority in the coalition gov. was vested in Sun Fo, only son of Sun Yat-sen, who became head of the executive *guan*, a post comparable to that of Prime Minister, the foreign minister being Eugene Chen. In this way some semblance of national solidarity against foreign aggression was brought about, though, as later years showed, it was far from effective.

The Sino-Jap. war of 1931-33 apparently arose out of disputes over Jap. interests in the Manchurian railway and, later, in the Shanghai area. Having overrun Manchuria in the autumn of 1931, the Jap. disembarked troops in the Shanghai area, alleging that there had been an organised Chinese boycott of Jap. imports. The League of Nations and the Amer. and Brit. Govs. tried to stop the conflict by reminding Japan of her obligations under the Nine Power Treaty of 1922. This treaty guaranteed Chinese sovereignty over Manchuria and the 'open door' for international trade. Japan was a signatory of this treaty, but she also had treaty rights over certain areas, which included that of maintaining garrisons in a defined railway zone. Moreover, Jap. investments in Manchuria were large, and for years the country, as an economic hinterland, had been regarded by Japan as vital to her interests. There was severe fighting early in 1932 in the Shanghai area. The Nanking forts were also fired on and a great attack launched at Chapel, while Jap. destroyers bombarded Woosung. In reply to the League of Nations, the Jap. Gov. refused to recognise C. as an organised people in the sense of the League Covenant, but avowed that Japan had no territorial or political aspirations in C. Negotiations for an armistice, however, broke down. A puppet state called Manchukuo was set up under Jap. control, C. ineffectually protesting against its estab. as a breach of her sovereignty. Then the Brit. and Amer. Govs. made a joint proposal for the cessation of hostilities, which Japan accepted, while rejecting the offices of neutrals in the settlement of the Manchurian dispute. A League commission under Lord Lytton went out, however, to Manchuria to investigate the position, and issued a report suggesting the creation of a special regime there which would maintain the sovereignty of C. while safeguarding Jap. rights.

But in spite of an overwhelming vote of the League in favour of the report, Japan rejected it, holding herself to be the chief power responsible for keeping peace in the Far E. She then resumed the struggle, which ended, so far as this phase of Sino-Jap. relations was concerned, by Japan placing P'u-yi, ex-emperor of C., on the throne of Manchukuo.

By the close of 1932, a large Chinese army under Chang Hsueh-lung, the

gov. forces retook Foochow and gradually crushed the rising.

Although an armistice had been signed with Japan, later events were to show that that power was very far from staying her hand in C. The salient feature in the hist. of C. in the twenty-five years before the Second World War was the gradual development of Jap. influence, and each step in the consolidation of that influence did but mark the culmination of a policy



New York Times Photos

THE LEAGUE OF NATIONS COMMISSION AND HENRY P'U-YI,
PRESIDENT OF MANCHUKUO

The leader of the commission, Lord Lytton, is on the president's right.

young Manchurian war-lord, was concentrated in Jehol to repel the further advance of the Jap. from Manchuria. But Jehol soon fell, and by May 1933 the Jap. armies had crossed the Great Wall and were standing outside Peiping. An armistice was now signed creating a demilitarised zone, and a political council was formed at Peiping with delegated authority from the executive *yuan* to negotiate with the Jap. for the restoration of the public services. In other parts of the country, however, there was much internecine strife. Disaffected elements from the Shanghai army were endeavouring to form a provisional gov. in Fukien with Eugene Chen as foreign secretary. Large Communist forces had begun a bitter struggle in Kiangsi, and, before all other factions had combined to repel them, had even menaced Amoy. But early in 1934 the

which was initiated as long previously as 1915, when Japan, taking advantage of favouring circumstances during the First World War, presented some twenty-one demands on C., acceptance of which would have reduced the country to the status of a Jap. protectorate. Their partial acceptance, however, gave Japan a strong hold in N. C., especially in Manchuria. After the First World War Jap. policy seemed to grow more conciliatory, and by the Nine Power Treaty, signed in Washington, Japan pledged herself to respect the sovereignty and territorial integrity of C., and even to seek no exclusive privileges there. The growth of Chinese nationalism, however, soon gave rise to friction with Japan. After the occupation of Peiping by the Nationalist armies, the autonomous gov. of Manchuria began to look to Nanking rather than to Tokyo for advice and tried to

undermine the position of the Jap. as lessees of the S. Manchurian railway, and it was this that led directly to the Sino-Jap. war of 1931-33 (described above) and the eventual estab. of the puppet state of Manchukuo. The Jap. armies actually marched on Peiping in 1933, but the city was saved by an armistice known as the Tangku truce, by which the Nanking Gov. agreed to prevent all anti-Jap. activities in N. C. The next significant event in C. was the pseudo-secessionist movement of the N. provs.—Shansi, Shantung, Hupeh, Honan, Shensi, and others. This movement was ostensibly a Chinese revolt against an oppressive gov. led by Chinese generals, and it might have been regarded as a natural movement of reaction against Communist or Bolshevik influences but for the cloven hoof of Jap. 'co-operation' in the movement at the time of its announcement.

Utter lack of political cohesion characterised C. in 1935-36. The Nanking Gov., under the leadership of Chiang Kai-shek, claimed to be the lawful Chinese gov. to speak for all C. But, although it was unquestionably the Central Gov. *de facto*, its political influence was by no means commensurate with the geographical area of the country. In the N. Manchukuo and Jehol, as well as those provs. under the control of the Hopei-Chahar Political Council, passed virtually under Jap. control. Outer Mongolia adopted a Soviet form of gov., and seemed, politically speaking, to be regarded to all intents as a protégée of the U.S.S.R. 'Soviet China,' in addition, comprised many areas in the interior and in Fukien which also adopted Communist regimes, and their presence inspired a series of military operations against them on the part of the Nanking Gov. with varying degrees of success. In the S. the S.W. Political Council—the so-called Canton Gov.—was for some time practically independent of Nanking, and it was only after July 1936 that the Central Gov. estab. any considerable measure of control in the S. provs. It was from those provs., and especially from Kwangtung and Kwangsi, that the greatest opposition to Jap. penetration, and to foreign penetration, had come. Sino-Jap. tension grew acute at the end of 1936, when a delegation of students of the univs. of N. C. pressed the Nanking Gov. to adopt a strong anti-Jap. policy. They demanded an alliance between the Kuomintang, Chiang Kai-shek's Nationalist party, the Communists, and all other organisations, in resisting Jap. aggression. Tension with Japan suddenly became acute in July 1937 with the outbreak of fighting between Chinese and Jap. troops at Lukouchiao. The whole situation in N. C. assumed a particularly grave character, and the possibility of any settlement became more and more remote, and, on July 28, Peiping was bombed by Jap. aircraft, and the unabashed invasion of further areas of C., without any declaration of war, began. At the close of one year (July 1938) the Jap. armies were in control

of one-third of C.—300,000 sq. m., with an estimated pop. of 130,000,000—after more than 1,000,000 Chinese and Jap. lives had been lost and the greatest misery suffered by the Chinese civilian pop. Probably the Chinese casualties were over 400,000 soldiers killed and twice as many wounded, while the Jap. had 100,000 killed and as many wounded. The total number of refugees was not fewer than 1,000,000, but the final toll of the war in famine, flood, and disease is not known. In the middle of 1938 Jap. armies of 1,000,000 were mobilised against 2,000,000 Chinese on fronts 1500 m. long, spread over an area more than half the size of Europe. Neither country showed any sign of yielding. In a statement from Hankow Gen. Chiang Kai-shek declared that 'China would continue to fight until she had driven the invader out,' while Prince Konoye declared that Japan would never consider peace with 'the Chinese war lord' and that foreign efforts to change her policy were useless. The Jap. war minister (Itagaki) even went so far as to say that Japan must face the possibility of ten years of warfare before Chinese resistance was crushed. The results of the campaign in the first year of the conflict showed that Japan had obtained nominal control over all the ter. bounded by a line running from Hangchow through Wuhu along the Yangtse to Hukow, N. eastward to the flood area, and all the country bounded by the bend of the Yellow R. northward into Inner Mongolia. They also occupied Amoy and controlled nearly the whole of N. C., the provs. of Shantung, Shansi, Hopei, Kiangsu, parts of Honan and Anhwei being also in their occupation. Peiping and Tientsin were entered almost immediately after the outbreak of the conflict, and in the former city a Jap.-created provisional gov. was inaugurated. Further S. the Jap. captured Shanghai after a prolonged resistance, and, following a rapid advance inland, stormed Nanking, the Nationalist cap. (Dec. 1937). The National Chinese seat of gov. had previously moved to Chungking (Szechwan), far in the interior, but the conduct of operations continued to be directed from Hankow by Chiang Kai-shek. As at Peiping, a Jap.-sponsored puppet gov. was estab. at Nanking. It was early evident that Japan's mechanised troops and modern equipment altogether outweighed the numerically superior masses of Chinese troops, whose lack of tanks, aeroplanes, and heavy mobile artillery found but little compensation in tenacity and bravery. But quantities of arms were constantly finding their way into C., particularly from the Soviet Gov., via Kansu, over the frontier from Fr. Indo-C. and via Hong Kong. Necessarily the conflict had repercussions on those countries which had commercial and business interests in the Far E. Moreover, the Jap. press began to criticise Britain, on account of the arms traffic through Hong Kong; there were incidents at Shanghai, and the wounding of the Brit. ambas. in Aug. 1937 by

machine-gun fire during a Jap. air reconnaissance led to a temporary deterioration of Anglo-Jap. relations. There was also some tension between Japan and the U.S.A., particularly after the sinking of the Amer. gunboat *Panay* on the Yangtse (Dec. 1937). With Germany and Italy, Japan's partners in the Anti-Comintern Pact (*q.v.*), however, Japan's relations continued to be cordial—a state of things which was destined in the following year to undergo a remarkable change when Germany, by signing a so-called non-aggression pact with Russia, revealed a cynical contempt for the fundamental basis of the Anti-Comintern Pact hardly greater than that of Stalin. At the end of June 1938 Japan stated that she proposed to occupy Hainan, the large is. near Fr. Indo-C., but the prompt action of the Fr. Gov. in occupying the Paracel Is., a series of coral reefs to the S.E. of Hainan, coupled with a warning from the Brit. Gov., deferred Japan from carrying out her intention. It has been estimated that the twelve months' campaign had cost Japan £430,000,000—the figures for authorised expenditure in the special C. estimates. This huge demand was met by increasing taxation and internal indebtedness, an issue of no less than 6,800,000,000 yen in bonds being authorised.

By the end of the second year of the conflict neither C. nor Japan was within sight of ultimate victory, and both countries recognised that the struggle would be prolonged indefinitely. Both govts. announced their determination to pursue the conflict to a victorious close. Marshal Chiang Kai-shek's manifesto emphasised C.'s determination to resist 'slavery and subjugation' with all her force; while Baron Hiranuma, for Japan, announced that the Jap. armies would remain semi-permanently in C. to preserve order and 'defend C. against the Comintern' until a new central regime which Japan was preparing for C. was firmly estab. In this second year of the war the Jap. took many important cities and considerably extended the already vast area under their control; yet no decisive military triumph could be recorded. It was evident that the Chinese tactics were to abstain from giving battle on a large scale but to maintain mobility of action and to keep on striking on all sections of the front with comparatively small forces. Hence, though the area in Jap. occupation had increased, this very increase involved the dispersal of their troops over an ever wider area, both for patrol purposes and to preserve essential communications. In the autumn of 1938 the Jap. pursued a vigorous drive up the Yangtse, and soon occupied Kiukiang (Aug.). In Oct. they captured Hankow and Canton. After the fall of Hankow there was a lull in operations for some months, although the Chinese continued their guerrilla tactics unabatedly. In Feb. 1939 the Jap. descended on the Is. of Hainan, a move which caused uneasiness to the Fr. Gov. but led to no action by them. In the spring of 1939 there was a

resumption of military activity with the launching of a Chinese offensive on all fronts; but apart from local successes in central C. and near Canton, the military situation was little altered. Later (May) the Jap. intensified their grip on the Chinese coast by landing at the international settlement of Kulangsu (off Amoy), and by occupying Swatow (June). In the N., near Shanghai, and in the Canton area, the Chinese carried on a well-organised guerrilla warfare, and, indeed, these tactics were pursued throughout the occupied areas. The general position then was that while the Jap. nominally controlled vast areas of C., their actual control was limited to key cities, ports, waterways, and railways, while outside the main lines of communication they had little or no hold on the countryside. But, necessarily, the effective control of the coast, especially after the fall of Canton, made it practically impossible for C. to import war materials by sea, and in 1940 her main arteries of communication with the outside world were the 'back doors'—the long caravan route from Lanchow (Kansu) in the N.W. to Asiatic Russia, and the new road linking Yunnan (Kunming) with Burma. This remarkable piece of road construction was completed in Dec. 1938 in spite of the greatest difficulties. Apart from military operations, the methods of passive defence adopted by the Chinese were the systematic devastation of the country before the Jap. advance, and the destruction of all roads, paths, and bridges—tactics which greatly retarded Jap. progress into the interior. The Jap. Air Force made frequent raids on all the chief centres of pop. under the control of the Chinese National Gov. The attacks on Canton in Oct. 1938 and on Chungking in May 1939 were especially destructive, the losses in killed and wounded amounting to thousands.

In the occupied areas the Jap. Gov. made strong efforts to exploit the economic resources of the country, and in 1938 a 'China Board' was formed in Tokyo for this purpose, and, later, development companies were formed with Jap. capital. A Supreme Council of N. C. was formed about the same time, in which were incorporated the Jap.-controlled Nanking and Peiping provisional govts.

Considerable friction developed in 1938–1939 between Japan and the W. powers, and protests were made by the Amer., Brit., and Fr. Govts. at the closing of the Yangtse to foreign shipping, a step which was contrary to the 'open door' policy which the W. powers had consistently upheld in C. The grant of an Amer. credit of \$25,000,000 to C. for the purchase of Amer. manufs. and primary produce also strained Jap.-Amer. relations, while the action of the Brit. Gov., in 1939, in deciding to assist C. by the creation of a £10,000,000 exchange stabilisation fund (*see Currency Measures, etc.*) evoked bitter protest from Japan. Tension also grew with France over the occupation of Hainan and the annexation of the Spratly Is., a small group in the

S. C. Sea, sovereignty over which was claimed by France. Tension grew still more acute with the Jap. landing at Kulangsu, the occupation of Swatow, and the blockade of the Brit. and Fr. concessions at Tientsin, with the consequent infliction of humiliations on Brit. subjects by Jap. soldiers.

China in the Second World War.—C. was rapidly changing before the Second World War. In the decade 1928-37 the W.-trained Chinese had their opportunity to secure administrative control within C. and to modernize the country. Under a strong gov. C. made great advances in industry, mining, education, and social services generally. Yet at the same time the nation was aware that Japan would thwart their development and resist the unification of the country. The Chinese Nationalists in 1928 held Shanghai and the Yangtse. Japan at once tried to prevent them from controlling N. C., and this brought on a crisis. The Nationalists realised that the other Treaty powers might support the Jap. against them. Hence they deliberately favoured Amer. and Brit. interests, estranged themselves from Soviet Russia, and broke with their own Communists, thereby effectually preventing a united front among the Treaty powers. Civil war between the gov. and the Communists logically followed the rupture with Russia; for the Chungking Gov. was increasingly representative of the growing Chinese capitalist class of merchants, bankers, insurance companies, factory owners, and shipping interests. Within the country, the National Gov. had to struggle against strong survivals of provincial separatism and varying degrees of resistance on the part of regional war lords. But gradually these latter began to rely on Nationalist military aid against Communist forces and finally to accept the administrative supervision of the Central Gov. New railways played their part in Nationalist progress, meeting both strategic and economic needs. The gov. now began to build lines to open up the hinterland, the two most important lines being one from Canton to the Yangtse at Wuchang and another, in N. C., which crossed the existing lines from Nanking to Peiping and from Hankow to Peiping into Shensi. It was largely with the aid of these new railways that C. withstood the Jap. offensives in 1937-38. In this same decade C.'s heavy and light industries expanded with unprecedented rapidity, and in all kinds of enterprises which had formerly been possible only under foreign ownership or management the Chinese manifested ever more enterprise and competence. The National Gov. also showed skill in dealing with foreign countries, whose conservative interests were calculated to resent any attempt by the Chinese Gov. to compel them to respect the national interests of C. The primary problem was the old desire of the foreign interests for a strong man to rule C. in their behalf, and they naturally favoured the idea of making Chiang Kai-shek their strong man. But Chiang

Kai-shek gradually succeeded in committing America and Great Britain, among the great powers, not only to support of the Chinese Gov., but to gradual relinquishment of their privileges; and this reacted against Japan, which stood alone in supporting territorial and political imperialism in C. and in doing so against the interests of the great W. democracies. C. in 1937 was well on the way to attaining the rank for which her pop. and resources qualified her, but which her prolonged repudiation of W. civilisation and the ensuing period of civil strife and confusion denied her. The turning-point was the Leith-Ross mission to C. in the winter of 1935-36; this, and the Chinese currency reform then successfully carried out with the co-operation of Brit. banks, constituted in Jap. opinion the abandonment by Britain of her traditional pro-Jap. policy. The prospect that C. would soon be receiving large credits for industrialisation on the basis of her new financial stability was one that alarmed the rulers of Japan. Brit. financial support was a factor of vital importance in enabling C. to withstand the Jap. invasion; hence the Jap. now believed that the only way to win the war against C. was to drive Britain by pressure and threats into withdrawing this support. The primary motive of Japan in the war which began in 1937 with the clash at Lukouchiao, S.W. of Peiping, was to prevent C. from becoming a great power. Hence arose a great struggle, involving directly 500,000,000 people in the two warring states, a conflict which would have been continually absorbing the attention of the world were it not for the war of even wider scope which was threatening to break out in Europe and involve all the great powers of the W. The conclusion of the Matsuoka Pact between Japan and Russia (April 1941) dismayed the Chinese Gov. of Chungking, although Chiang Kai-shek himself never lost confidence in the W. powers. Despite the pact it soon became evident that C. had no cause for apprehension. Moscow intended to continue assistance to C., and Britain and the U.S.A. announced new currency credits. Although relations between the Chungking Gov. and the Chinese Communists could best be described as merely an armed truce, the higher leaders on both sides appeared determined to prevent the dispute from interfering with C.'s resistance to the invaders. In her struggle for survival, C.'s progress towards a more representative gov. might be slower than liberal elements could wish, but she had seen in totalitarian states what an armed party within the state could mean, and, moreover, if the Chinese, like the Brit., had a genius for compromise, they also knew when to say 'Thus far and no farther.' The Matsuoka Pact did nothing to help the Communist cause in C. and the internal dispute was as far from an early climax as ever.

After repeated raids, with large numbers of war planes, the Jap. had, by mid 1941, still failed to realise that

they could bomb Chungking for years without much effect. The city had the finest passive air defences. Dug-outs were built in solid rock capable of sustaining direct hits by the heaviest bombs. Although scarcely a building had remained undamaged in the whole of Chungking the city rose again as fast as the Jap. could knock it down. No matter how long the bombing was maintained, it could not affect the war of resistance. Similarly, the bombing of the Burma Road (q.v.) might hamper, but could not stop, the flow of supplies into 'Free China.' Handicapped in some of their theatres of war through lack of equipment, the Chinese were still largely unable to resist major Jap. attacks in the field. With the vast number of troops at their disposal, however, they could constantly form new concentrations in different parts of the country, which the Japs. were compelled to break up in order to prevent threats to the bigger cities in their hands, and even at this period the will of the Chinese to carry on the war in spite of many a set-back remained unimpaired. The rebound from the Matsuoaka Pact came quickly in the Brit. and Amer. credits, the arrival of an Amer. air mission in Chungking, and the Brit. ambas.'s assurance that the Burma Road would be kept open.

The Communists were, however, considerably increasing their power, especially in the later years of the Second World War. They had no confidence in many of the Kuomintang leaders, who, they averred, had been at least as interested in fighting them as in fighting Japan. In the later stages of the war in C. guerrilla activity rather than regular warfare contained the larger part of the Jap. forces. In early 1944 some twenty-two divs., or 64 per cent of the Jap. forces in C., were operating against Communist troops behind the regular front. The Japs. began an offensive in Honan just before this time, but even then the forces withdrawn from those operating against the guerrillas were small. In addition to these Jap. forces, the puppet army of 750,000 men under Wang Ching-wei was engaged against the Communists. Yet in this struggle behind the regular fronts there were few large battles. The Communist forces claimed, however, that in the twelve months between June 1943 and June 1944 they accounted for nearly 200,000 Jap. and Chinese puppet forces, besides taking 75,000 prisoners. During 1911 and 1942 the Jap. gained some ground, but from 1943 were losing. The pop. paying taxes to the Chinese Gov. rose from 50,000,000 to 80,000,000, the Jap. lost or abandoned 13,000 forts, involving a consequent loss of motor roads and blockade ditches, and in the first half of 1944 the Chinese recaptured twenty-four *hsien* (co.) cities and retained control of at least a third of them. With some justification the Communists claimed that only their forces, at this time, had been able to carry on effectively this war behind the enemy lines, even though they had received no supplies from outside, even from Russia;

and they maintained that in 1941 there were nearly 1,000,000 Central Gov. troops fighting behind the Jap. lines, but that by 1944 their number was no more than 30,000, many having deserted to the enemy. By this time the main Communist forces behind the Jap. regular front were the Eighth Route Army, with 320,000 men serving in an area extending from the Lunghai railway up to S. Jehol and Liaoning in Manchuria; the new Fourth Army of 150,000 operating S. of the Lunghai railway in Kiangsu and parts of Anhwei, Hupeh, and Chekiang; and small forces operating near Hong Kong and on Hainan Is. These regular troops were equipped with rifles, light machine guns, and Jap.-pattern grenade-throwers. They also had some heavy machine-gun and trench mortar units and a few captured Jap. guns. Co-operating with them was a Home Guard organisation of 2,000,000 men. But the limiting factor of the operations of these Communist armies was shortage of ammunition. They had nothing but what was captured from the enemy or made in small local arsenals. This shortage enforced close-range fighting and often made it impossible to liquidate a Jap. force after it had been surrounded. Moreover, the shortage prevented them from bringing about any serious dislocation of Jap. railway communications or damage to industrial installations. With reasonable ammunition supplies, the Chinese forces would have been able to weaken the whole Jap. position in N. and central C., and it was a situation which clearly offered a great opportunity in the allied war effort against Japan. Unfortunately the Kuomintang had for some years enforced a strict blockade of the Communist areas. The Communist party considered that it was impossible to overcome C.'s military and economic difficulties without the introduction of democratic reforms and they could certainly make political capital out of the comparative success of their armies operating under logistic difficulties, but with full popular support, as against the rapid collapse of the Kuomintang armies in Honan and their severe defeats in Hunan. It was generally believed in Yenan, the Communist centre, that the widespread desertion of Kuomintang forces to the puppet armies was the result of a deliberate policy to build up a force which could preserve N. C. for the Kuomintang after the collapse of Japan. Failing an agreement between Yenan and Chungking, indications in 1944 were that the collapse of Japan would leave N. C. in the hands of the Communist forces and that it would be extremely difficult for the Kuomintang to dislodge them.

After the downfall of Japan civil war supervened on a large scale in N. C., the provs. principally affected being Shantung, Shansi, and Suiyuan. Most of the fighting in Oct. (1945) was around Changchih, in S.E. Shansi. The Chungking Gov. made an offer to Yenan to respect the *status quo* in Communist areas if the Communist troops ceased attacking the

railways; but this offer was rejected because the Communists feared that the gov. might then gain control of Communist areas. Fighting was also in progress in Hopel, Shensi, Honan, Anhwei, Hupeh, Chekiang and Kwangtung. In the midst of this confused situation Central Gov. forces were landed at Chingwangtao from Amer. transports. Some of the Communist troops were under the leadership of Chang Hsueh-shih, son of the war lord Chang Tso-lin and brother of the 'young marshal' Chang Hsueh-liang who had been under Central Gov. detention since he helped to organise the kidnapping of Gen. Chiang Kai-shek in Dec. 1936. Meanwhile the Russian forces in Manchuria had announced that they were withdrawing from Manchuria (under the terms of a Sino-Soviet treaty concluded since the war) and that Central Gov. troops were due to take over Manchuria. These latter, however, were arriving only to find themselves faced by considerable armies of well-armed Chinese Communist forces. All these developments caused serious concern in Washington, particularly as there was a danger of Amer. troops becoming involved. On Nov. 4, 1945, an overwhelming force of Communists captured Kweisui, cap. of the prov. of Suiyuan. Ten days later powerful gov. forces landed at Tsingtao in a determined effort to clear Shantung of the Communists. After these events a military and political truce was arranged between Chungking and the Communist leader Gen. Chou-en-lai; but in Feb. 1946 civil war prevailed in Manchuria, where it was suspected that Russian influence was frustrating the Chungking Gov.'s efforts against the Communists. Following close upon the successful advance of the gov. troops in Manchuria in the summer of 1946, a 15-day truce was arranged, during which the Amer. Gen. Marshall made an effort to find a basis for a permanent settlement of the Chinese civil war, but evidently with no real hope of success. The grim fact was that C. was on the brink of a most disastrous civil war at a time when sev. million innocent peasants were on the verge of starvation, C.'s export trade was at a standstill and her post-war reconstruction had not even begun. The 'unofficial war' between the Communist and gov. or Nationalist forces, which had been dragging on for a year or more, flared up in July (1946) into what seemed to be a full-scale test to decide who should be master. The situation was the more confused from the fact that the Communists frequently asserted their faith in Gen. Chiang Kai-shek personally, while it was still open to them to enter the coalition gov. agreed upon at the Chungking conference of all parties in Feb. (1946). The gov., for its part, also protested that it still earnestly desired to end the conflict by agreement through the peace envoys of Gen. Marshall. Meanwhile Nationalist forces were launching an attack on the Communist front in Kiangsu, N. of the Yangtze, and developing an offensive in the Kirin

prov. of Manchuria, employing in these general attacks quantities of lend-lease Amer. weapons, including destroyer escorts, minesweepers, and aircraft. Early in Aug. Nationalist aircraft made a strong attack on the Communist cap., Yen-an. A week later Gen. Marshall (Amer. ambas. to C.) and Dr. Leighton Stuart issued a statement in Nanking indicating that a peaceful settlement was impossible at the moment and there were persistent rumours that the general was convinced that the mission on which President Truman had sent him was a failure. A desire for a peaceful settlement of the political problem appeared to be almost unanimous on the part of the Chinese people; while the economic situation called for a prompt solution if disastrous collapse were to be avoided. But the internecine strife was daily growing more widespread and it now threatened to engulf the country and pass beyond the control of the responsible leaders on both sides. The country was exhausted after years of intermittent civil war, the last eight of which had been combined with the war against Japan; the rise in the cost of living was enormous and the Chinese dollar which, before 1936, was worth about 30 Amer. cents was, in July 1946, valued at 3000 to one Amer. dollar, but, inasmuch as the Amer. dollar was greatly undervalued in C., financial experts put the true valuation at more than 10,000 to one. Such inflation might seem to threaten a complete and absolute collapse, but, with 85 per cent. of her people engaged in agriculture, C. does not react to inflation in the normal way. Again, while millions of peasants were starving in the countryside, many of C.'s larger cities were reasonably well supplied with both essential goods and luxuries. National disasters in C. occur so often that they come to be accepted and do not entail widespread social upheavals. The national inclination to hound, so common in the E., was one of the many difficulties, too, that confronted the United Nations Relief and Rehabilitation Association's operations in C. The U.N.R.R.A.'s supplies were, in fact, not consumed because the Chinese knew that sooner or later conditions might get worse. That fear was justified in view of the fact that the protracted warfare kept an unusually large number of men in the unproductive occupation of killing one another. Bombings, burnings, and pillage had reduced the food stocks and the area of land under cultivation; while droughts, floods, plagues, broken riv. dikes and sea walls had added to the destruction. Late in Aug. (1946) in Manchuria, Communist forces struck a blow at the railway between Mukden and Changchun and in C. proper fighting was in progress in Shansi prov., but Nationalist reinforcements were quickly sent to save the railway. Although the fighting had now increased in both strength and bitterness, neither side was prepared to acknowledge that a full-scale civil war had begun. The efforts of the

Amer. mediators were still politely welcomed. Gen. Marshall and Dr. Stuart had obtained the assent of both sides to the appointment of a committee, under Dr. Stuart's chairmanship, to discuss the formation of the State Council which was to be the mainspring of the projected Coalition Gov. According to the Chungking agreement the council was to consist of 40 members, half from the Kuomintang and half from the other parties, and its constitution was designed to mark the formal ending of the Kuomintang dictatorship and the dawn of a democratic system. But the efforts of the mediators were now being frustrated by the rapid march of military events. Gen. Chiang Kai-shek, in reply to the Communist attacks upon gov. communications and garrisons in violation of existing agreements, now launched vigorous drives N. of the Yangtze, in Shantung, in Jehol, and in Chahar, and the Communists were unable to resist the better equipped Nationalist troops. An advance on the Communist centre of Kalgan threatened to undermine the entire position of the Yen'an administration in N. C. The Communists had now also suffered equally serious reverses in Manchuria; Harbin and Kirin were now threatened. Yet there always seemed to be the hope of an understanding on the foundation of the Feb. agreement, while the Communists, though so jealous of the enhanced political prestige and military power of the Central Gov. as to be determined to maintain a separate regime, yet refrained from taking the step of summoning a rival assembly under their own auspices. This last possibility, indeed, underlay the strong opposition of Gen. Chiang Kai-shek to any attempt by the Kuomintang to modify the constitution drafted by the all-party conference, a constitution more liberal than the earlier drafts based directly on the ideas of Sun-yat-sen. The efforts of President Truman to mediate were not due to an intention to interfere with Chinese domestic politics, but throughout the Second World War America had counted on C., almost as her protégée, to take over the leadership of Asia and, furthermore, President Truman insisted that C. had an obligation to United Nations to eliminate armed conflicts inside her ter. But at the end of Jan. (1947) the U.S. Gov. formally abandoned its long sustained effort to mediate in the quarrel, criticising extremist elements in both Chinese camps and suggesting that the salvation of C. lay in the assumption of leadership by the Liberals in the Kuomintang and the minor political parties. Economic conditions in C. at the opening of 1947 were such as would in any other country inevitably lead to revolution; but the evils affecting C. at this time were nothing novel. From the overthrow of the Manchus in 1911 right down to 1937 some kind of civil war had gone on year by year. Merchants and peasants had complained about over-taxation, corrupt administration, and lack of communications. The Yangtze had repeatedly

broken its banks and caused disaster. The troubles affecting C. were now so numerous and so closely interlocked that to unravel them would be the task of a number of years. Meanwhile in the political field relations between the Kuomintang and gov. and the Chinese Communist party, after endless negotiations and the desperate efforts of Amer. mediators, were now definitely worse than they were in the spring of 1946. One of the main demands of the Communists was that they should retain control over what they called the 'liberated areas,' which they wished to run on Communist principles. But such an ideological division could hardly help in restoring the Chinese economy. The passing of the constitution drafted by the Political Consultative Council in Nanking was hailed in some quarters as a great step forward. But the holding of the National Assembly was premature in view of the absence of the Communist party and the Democratic league. The constitution was passed in its original form by personal intervention of Chiang Kai-shek and it left many vital points unsettled—the numbers and divs. of the electorate; the relations of the executive to the legislative *quan*; the powers of the prov. councils in relation to the Central Gov.; and the divided economic interests of the N. and S. provs. The passing of the constitution had not answered the questions: What would happen if President Chiang Kai-shek were to retire? Could C. hope to remain united under some form of democratic gov.? The severity of the Chinese Gov.'s remedial measures in Feb. matched the seriousness of the country's economic plight. Her currency was pegged at a realistic level, and stringent war-time controls were reintroduced. The rate of exchange was now 12,000 Chinese dollars for one Amer. dollar. Trade in gold and foreign currencies was prohibited and private fortunes abroad were ordered home. The announcement of these measures was made in Nanking (Feb. 17) with a frank statement by Gen. Chiang Kai-shek that C.'s survival as a nation was at stake.

Nanking Government loses Manchuria and North China to the Communists.—The refusal of the gov. to carry into effect the political accord embodied in the resolutions adopted by the People's Political Conference in April 1946 gave the Communists legitimate ground for complaint, though the incurable suspicion in which they held (and hold) the Kuomintang was the primary cause of their failure to accept the army reorganisation upon which Gen. Chiang Kai-shek insisted. Hence the continuance of the civil war, which now dragged on into 1947 in the indecisive manner so characteristic of Chinese internecine conflict. The position in the early months of 1947 was that Gen. Chiang Kai-shek was directing his operations to the restoration of communications on the Tientsin-Pukow and Lung-Hai railways in N. C., and to the recovery of the ter. N. of Changchun up to the N. Sungari R.

and including Harbin. The Nanking Gov.'s forces numbered at this time about 2,750,000 men with garrison troops; while in Manchuria they numbered some 250,000. The Communists, in order to interfere with the gov.'s advance against Harbin, mounted a drive (spring 1947) against Changchun with over 200,000 men, the largest force they had put in the field at any one time. This drive was only held by the gov.'s forces after it had reached to within a few miles of Harbin; but, though the Communists were driven

they feared extermination by force, but that they would resist with a tenacity which could easily bring administrative and economic ruin upon any gov. imprudent enough to embark upon such an undertaking. The strength of the Communists in C. depended and still depends upon the contrast existing in public opinion between certain meritorious features of the system they practise and the many evils which the gov. still tolerated within its own ters., and in the eyes of foreign observers it seemed evident



New York Times Photos

IN THE VILLAGE OF LISON, FIVE MILES NORTH-EAST OF TSINGTAO,
SHANTUNG PROVINCE

back, the gov. forces were also compelled to turn back. In the Shantung operations the gov. were now employing some 500,000 men in groups operating along the railways mentioned above. The mountainous country N. of Tientsin to Tsinan, the cap. of Shantung and junction of the two railways, was strongly held by the Communists, who were now threatening Tsinan. The recovery of these railway communications by operations constantly harassed by Communist guerrilla attacks was to prove a much harder task than the Nanking Gov. had calculated. In March (1947) the gov. had announced their occupation of Yenai, the remote Communist cap. in Shensi. But that stronghold had been stripped and deserted so that its seizure had no great strategic effect on the anti-Communist campaign. Experience seemed to show that the Communists were formidable only when

that the attraction of Chinese Communism would diminish in exact proportion to the success with which the Nanking Gov. set its house in order.

In July the Chinese State Council decreed 'total mobilisation,' an indication of the serious crisis facing the Nanking Gov., which ascribed its misfortunes to Russian intervention. But there was no convincing evidence that such intervention was really responsible either for the friction between the Outer Mongolian Republic and the Chinese prov. of Sinkiang or for the military reverses which the gov. had at this time suffered in its ill-advised attempt to suppress the Communists by force of arms instead of effecting salutary reforms while permitting the Communists to exist in a separate state N. of the Yellow R. The significance of the crisis lay in the gov.'s frank acknowledgment of its dependence upon Amer. aid to

enable it to carry the civil war to a successful conclusion. The task of reconstructing war-ravaged C. could be accomplished only by a planned national effort on a comprehensive scale, of which the condition precedent was a coalition administration supported by progressive as well as conservative opinion. After the Second World War political reorganisation left the Kuomintang in effective control behind a democratic façade, but was not an honest attempt to carry out the proposals of the Joint Political Consultative Council of 1946, on which many hopes were based by C.'s friends abroad. The Communists and the Democratic League had held aloof, while the Kuomintang and its offshoots, the Youth party and the Democratic Socialists, had abandoned all pretence of conciliation. President Chiang Kai-shek, relying upon his Amer.-trained and equipped troops, was confident of speedy victory earlier in 1947 when he launched an all-out offensive against the Communist-held areas; but following the Pyrrhic victory of the capture of Yen-an, the tide of war turned. The Communists, with the support of the rural pop., concentrated on attacking communications and, keeping their own forces intact, inflicted great losses on the gov. forces. Heavy fighting continued in the summer (1947) in Manchuria, where gov. forces were still struggling to reopen the railways. The military misfortunes of the gov. served to aggravate its economic plight, which in turn made the prosecution of the war more difficult without foreign aid.

Towards the late autumn of 1947 the situation of the Nanking Gov. had deteriorated markedly. In Shantung their forces had recovered the Tsingtao-Tainan railway and the ports of Chefoo and Weihaiwei; but large Communist forces had escaped into Kiangsu; others had overrun Honan, Anhwei, and E. Hupeh, and reached the N. bank of the Yangtze; while those driven out of N. Shensi in March had seized fresh areas of hitherto unoccupied ter. in the neighbouring prov. of Shansi. Another group of Communist forces had crossed the Yellow R. from S. Shansi and spread into W. Honan. In Hopei the N. section of the Tientsin-Pukow railway and the Peiping-Paoing corridor along the Peiping-Hankow railway had been lost by the gov. and the Peiping-Paoing-Tientsin triangle, which they had cleared in Sept., had now been reoccupied by the Communists. In Manchuria the situation was even worse: the narrow corridor along the main railway, held by gov. forces, had now been reduced to a few isolated areas, and the whole forward area N. of Changchun to the Sungari R. had been abandoned. In the midst of these military preoccupations certain sections of the Kuomintang had severely criticised the gov. for its weak-kneed attitude towards the U.S.A. over that country's alleged lenient treatment of Japan and towards Russia mainly over the question of the recoupation of Dairen. The points of dispute, however,

between C. and Russia were neither numerous nor serious, and Dairen was not an insoluble problem were it not for the presence of Communists in S. Manchuria. But Chinese business circles had observed with growing envy and alarm the rapid recovery—with Amer. assistance—of Jap. economy. Following the visit of an Amer. mission under Gen. Wedemeyer, there was deep disappointment in C. when it became evident that there was no prospect of any immediate or unconditional financial assistance from that quarter. The question of Amer. assistance had been the subject of much dispute behind the scenes in C. Some, chiefly the military leaders, were opposed to the acceptance of any aid on a conditional basis; others, representing financial and business interests, recommended acceptance on almost any terms; others, representing the moderates of the Kuomintang, held that C. should accept aid provided that Amer. conditions did not affect the prestige of the Nanking Gov. or infringe Chinese sovereign rights. In fact, however, these sev. viewpoints were immaterial except in so far as that of the military leaders prevailed over the others.

By March (1948) the whole of Shansi was in the hands of the Communists. Honan was almost completely overrun, except for a large patch with Chengchow at the centre. The Communists had strengthened their grip over Manchuria and N. C., while the S. Manchurian railway was largely destroyed. The Peiping-Mukden line had been out of commission for sev. weeks, and large portions wrecked. With the loss of Liaoyang and Panshan two important ports to the S.E., Mukden was still further isolated. Communist efforts to break into Chahar and Suiyuan from Jehol were, however, decisively thwarted. But the whole N.E. of Hupeh was in the hands of the Communists, who had now cut the Hankow-Ichang railway, and were pushing westwards. The strength of the Communist party, which had enabled it to hold its own against the numerically stronger and better equipped forces of the gov., was due to the enthusiasm and fanaticism of its leaders; to the discipline and able command of its military forces, some of whose generals had been through a thorough military course of instruction in Russia; to its able conduct of guerrilla warfare; and to the growing discontent towards the Kuomintang, coupled with chaotic economic conditions.

The gov. of the liberated areas—as the Communists style the regions under their control—is a dictatorship under their leader, Mao Tse-tung, assisted by a small committee. The local administration of the areas is carried on by commissars and propagandists—generally educated men and women who have been specially trained at the Univ. for Oriental Peoples in Moscow. The main item of the Communist platform is agrarian reform. Apparently neither communalisation nor state ownership is contemplated, but rather confiscation and a redistribution of land so as to ruin the wealthy class of

peasants—much indeed as the kulaks of the Russian agric. community were destroyed under Stalin's reforms—a process which was to be accelerated by a great increase of workers' wages, the cancellation of their debts, and the reduction of their rents. But, in the eyes of the Communists, the more important aspect of their policy is the inculcation of Marxist principles, and they envisage establishing the domination of the party over the whole life of the people, and their leaders interfere even in the most private details of family life. Their attitude towards religion is hostile on principle. Buddhist and Taoist temples have been despoiled, and the younger monks compelled to join the forces. The relations of the Chinese Communists with Russia, however, are wrapped in mystery, and all that can be stated with certainty is that the Soviet Gov., in accordance with its familiar policy in Europe, is well content to see the Kuomintang in difficulties while it favours a pro-Amer. policy. Communist tactics, aimed at producing such chaos in the country as might conduce to the collapse of the existing regime, have met with much success, but there is still a great way to go, for C. is a vast country. Huge regions in the W. and S. still remained outside the war, and even though the Kuomintang might now be compelled to abandon Manchuria and N. C., it would still have large resources to fall back upon. Moreover, the Communists, in spite of their territorial gains, had so far failed to set up any stable administration, and were repeatedly driven by counter-attacks out of captured towns or areas, so that both sides seemed by the late autumn of 1948 to be as far as ever from ultimate and decisive military success. With a few notable exceptions, too, most of the actions of the war were by no means as fierce and desperate as the propagandist estimates of enemy casualties issued by each side might lead one to suppose; and indeed the loss of life among civilians was probably much higher than that of the military forces. The Communists had proclaimed long previously that their strategy was to destroy communications, mines, and industrial plant, and to create such economic havoc as must involve the downfall of the Nanking Gov. Yet by this time it might seem that all they had succeeded in doing was to inflict terrible misery on the common people without vitally injuring the gov. or the wealthy classes; and if the civil war were to continue much longer, in its present manner, the Communists, even if successful in N. C., would find themselves embarrassed with the control of a completely ruined country.

For the interminable war was inflicting grievous misery on a third of C. Inflation was followed by a tremendous increase in the cost of living and flight of capital. There were serious rice riots in W. and central C.; the provs. were proving insubordinate towards the central gov.; there was indiscipline in schools and univs. and general unrest among all classes. Furthermore it now seemed that the

administration of N. C. might be abandoned by the Nanking Gov. which, on account of the menacing military situation there, had been compelled to appoint the one successful general, Fu Tso-yi, as local dictator over a huge area comprising Jehol, Hopei, the N. part of Shansi, Chahar, and Suiyuan, with his cap. at Taiyuanfu. Fu had created a purely N. administration, from which he had excluded all Nanking personnel, a course to which Nanking had offered no resistance lest worst might befall. Fu's chief weakness was a lack of arms and equipment wherewith to hold his vast front. Whether he would obtain the necessary arms seemed to depend on whether the Nanking Gov. preferred to hold a semi-independent N. C. or forfeit it altogether to the Communists. At this time the three N.W. provs., Kansu, Chinghai, and Ninghsia, presented a difficult problem for both sides; for though collaborating with Nanking against the Communist threat, they were in fact petty independent states organised somewhat on Fascist lines, with small disciplined armies of Muslims, which had been instrumental in driving the Communists out of Shensi.

The over-all picture in C. towards the end of 1948 was that the Nanking Gov. had made no attempt to check the corruption that prevailed in higher official circles. No attempt had been made to tax the wealthy to pay for the war. None of the chief Nationalist generals had been superseded or punished for inefficiency. Little use had been made of the gov.'s numerous air force to assist the land forces, even though the Communist rebels had no air force; foreign trade was dwindling, gov. monopolies were increasing, and the gov. had formulated no definite economic plans, such as might be expected of any realist gov. which was determined to exorcise the spectre of popular discontent, and to defeat a rebellion which owed its success less to victories over ill-led Nationalist armies than to the gov.'s administrative sins of omission. Meanwhile there was a rapid debacle in Manchuria, which indicated the complete collapse of the morale of the Nationalist armies. Whether Amer. aid could have saved them might be disputed. Behind the Amer. Democratic administration's policy, based since the spring of 1947 on Mr. George Marshall's refusal to come to the help of either side, was always implicit the belief that, although withholding of Amer. aid would probably make it impossible for Gen. Chiang Kai-shek to defeat the Communists, it would not put his regime in danger, and a long period of stalemate was the worst that might be expected. But the culminating point of the Nanking Gov.'s ineptitude came at the end of Oct. (1948) when Communist troops broke into Mukden. This irruption, which in effect marked the turning-point of the civil war, was soon followed by the fall of the city and the surrender of its once-powerful Nationalist garrison. This crack armoured div. had been transported early in the summer by sea from Shantung in a vain effort to keep

open the corridor leading to the Manchurian cap. Had the garrison been able to withdraw safely before the Communist armies closed round the city, the balance of military power between the two sides might not have been seriously affected, for Mukden had become a salient which was difficult and costly to defend; but the garrison of Mukden had lost its fighting spirit and evidently had little confidence in its local commanders and believed that the Nanking Gov. was powerless to relieve it, especially as President Chiang Kai-shek was still relying on more Amer. aid. This, Mr. Dewey, Republican candidate for the presidency, had promised to give if he should succeed President Truman, though Amers. were becoming more dissatisfied at the Nanking Gov.'s inefficient use of the aid already given. The elimination of the garrison of Mukden meant that the Communists, now masters of Manchuria, could concentrate against the few remaining strongholds of the gov. in N. C., and the fall of Taiyuan, cap. of Shansi, was expected at any moment. For Gen. Fu Tso-yi had insufficient troops and arms to hold out against Communist forces who were superior in numbers and well armed—with Nationalist captured arms and equipment—and contemplated withdrawal into Chahar and Suiyuan. The effect of these disastrous blows was, moreover, likely to have repercussions throughout S. C., adding to the sense of fear, frustration, and despair at the central gov.'s lack of leadership.

The immediate reason for the disastrous turn in the military situation—which lost the gov. in succession Chefoo, Kaifeng, Chinchow, Changchun, and now Mukden—apart from faulty generalship, was the poor morale of the Nationalist forces. This was assignable to many causes: dissatisfaction of the common soldiers and junior officers with conditions of pay, food, and clothing—especially when these conditions were compared with the high living of the senior officers; the appointment of officers with no military training or experience; general war weariness, many of the Nationalist divs., especially in Manchuria, fighting what they realised was a losing battle for over two years without relief; and lack of interest in the cause for which they were fighting, the greater from the fact that many of the divs. were composed of men from distant provs., whereas the Communist divs. were recruited entirely from the local pop., which had long been separatist in sentiment. The news of the surrender of the Changchun garrison of 80,000 men which refused to continue fighting, had a further depressing effect on the spirit of the other gov. forces and in fact was followed by the surrender of seven divs. in the corridor (a small strip including Peking and Tientsin), thus sealing the fate of Mukden and Manchuria. Gen. Fu was now in a hazardous situation. With a force of no more than 300,000—two-thirds of which were Nationalist divs. of problematical quality, the remaining third being his own well-seasoned troops—his task was to hold a

front reaching in a vast arc from Paotow, in the N.W., to Shanhaikwan, in the E.; while some of his divs. were strung out along the Peking-Hankow line well S. of Paotow. The Communist armies, flushed with victory, had above all been enormously reinforced with captured arms, artillery, munitions, and other equipment.

It was not long before the Communists followed up these successes by thrusting southward along the Suchow defence line protecting Nanking—the gov.'s plight being aggravated by food riots in Nanking and Shanghai which only ended with the imposition of martial law (Nov. 11). Then for the first time in many months, however, gov. forces seemed to have rallied at a strategic point. Yet it was never certain that the Communist forces of Gen. Chu Teh would try to storm Suchow; for usually Communist tactics consisted in surrounding a town, and, while waiting for it to fall from within, pushing on through the countryside. At most this promised only a single check after months of gains which had tilted the scales—military, industrial, and ideological—to the Communists. Their broadening grip on large areas of N. and central C. had a much deeper implication than the Jap. invasion of ten years previously; for the Communists—decisively helped by Russia and avowedly Marxist—were organising native revolutionary forces wherever they advanced. In its vast scope and probable consequences the present upheaval was rather assimilated to the Russian Oct. Revolution—from which it directly and obviously sprang. The capture of Mukden, followed so closely by reports of a threat to Nanking (over 700 m. farther S.), suggested a swift war of movement. What in fact happened in each case was that the Communists built up their strength in a broad area of the countryside and at a given moment extended the area to press against the chief tns. Their first and main area was Mukden, which, however, they largely took over while Soviet troops were in occupation. They received Jap. arms and arms factories, especially in Dairen; and they obtained more arms from the gov. troops with the fall of Changchun and Mukden. Their second area—separated from the first by only a small Nationalist strip which included Peking and Tientsin—stretched from Yenai to the coast almost engulfing Suchow. It was the possession of these areas that gave them their strength.

The next area of decisive fighting was that around Suchow, which city was the Communists' most important objective since the capture of Mukden in view of its relation to Nanking. At the end of Nov. the 250,000 troops making up the Nationalist garrison of Suchow, following some weeks of confused fighting, abandoned the stronghold on orders from Nanking to hasten to the relief of the 140,000 troops of the 12th Army Group now encircled S.W. of Suhsien. This latter group had, not long previously, marched eastwards through Anhwei prov. to the support of their outnumbered comrades

in the Sulsten area. The Suchow garrison, having abandoned that city, was now fighting its way southwards to Pengpu, but encountered stiff resistance at Kuehng which it was captured by the Communists. The garrison and other troops comprising three Nationalist army groups had failed to relieve the 12th Army Group and, in their abortive efforts to do so, had sustained 30,000 casualties. In the rapidly deteriorating situation President Chiang Kai-shek on Dec. 10 ordered the extension of martial law to the whole of C. under Nationalist control except the W. provs. and Formosa. About the middle of Dec. the situation around Peking suddenly took a serious turn for the worse from the gov.'s standpoint: for Gen. Lin Piao's well-trained Manchurian troops, having driven back Gen. Fu Tso-yi's best gov. troops on a front 30 m. E. of the line Peking-Tientsin-Tanku, had advanced to within 10 m. N. of Peking, and the W. airfield only 3 m. outside the city was evacuated. The gov. forces, which had abandoned Suchow and withdrawn 100 m. southwards to Pengpu from where it estab. a new line of defence for Nanking along the Hwai R., now made a further withdrawal, this time to Chuhsien, only 30 m. N.W. of the cap. Early in 1949 the Nationalist Gov. decided to open peace talks with the Communists, but on conditions which the latter rejected out of hand and Chiang Kai-shek then resigned.

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Chinese Literature.—The Chinese reverence literature above all things. The writing brush or pencil was invented under the Ch'ins, and the Chinese were producing some of the greatest literature before Rome was founded, and sending emissaries to collect literary texts in India at a time when Saxon pirates were raiding the coasts of Britain. War was and is anathema to them; and though, under the Ch'ins, the sword was mightier than the pen, notably when Shi Hwang Ti, the conqueror of China, tried to blot out the past by burning all the Confucian books and executing some 460 of the *literati*, there was a revival of learning under the Han dynasty when the classics were, though only with difficulty, recovered from the walls of houses or restored from the capacious memories of men. The literary output of the Chinese has always been on a vast scale, a fact which is due to the early invention of block printing in China, and though a great number of Chinese works have disappeared in the waste of war and fire, much has survived. It was during the sixth century that the art of taking impressions on paper from wooden blocks was invented, mainly for religious pictures and tracts; but this art was only generally applied to the production of books in the tenth century A.D. when the Confucian Canon was so printed for the first time. Movable types of baked clay were invented about A.D. 1050, and some centuries later were fashioned of wood and copper or lead, though they never ousted block printing from favour, and most of C.'s great literary works have been produced in this latter way.

As early as the sixth century B.C., the Chinese had a written language adequate to express any and all human ideas, a language practically identical with the present script. The founder of Chinese literature was Confucius, and the best authorities think that it cannot be asserted that there was anything in the nature of general literature before his time. Confucius, however, was a diligent collector of the utterances of earlier and often legendary rulers, and in this respect a kind of Chinese Homer. His great collection now known as the *Shu Ching* or *Book of History*, compiled from a hundred sources, is the beginning of Chinese literature. From the book, a small portion of which is in verse, we can reconstruct the story of the Chinese from the twenty-eighth to the eighth century B.C., and in particular the reigns of Yao and Shun, the so-called 'golden age' of China. Two of the documents in this book are homilies against luxury, while another contains an allocation to an assembly of nobles by Wu Wang, the first monarch of the Chou dynasty, condemning the Shang dynasty, which he overthrew. Confucius also preserved the *Shih Ching* or *Book of Odes*, containing some 300 poems, lyrical and historical, many of which treat of warfare and marital fidelity, and others of agriculture, hunting and feasting, and official tyranny. They are a valuable record of the manners

and customs of the Chinese before the time of Confucius. The idea of a Supreme Being is emphasised in the odes, and it appears that the Chinese conception of it was anthropomorphic. But the most famous and perhaps the oldest of all Chinese works before Confucius is the *I Ching* or *Book of Changes*, ascribed to Wen Wang, known as the Western Chief, and virtual founder of the Chou dynasty. It is a system of philosophical speculations based on the sixty-four hexagrams, and expresses enigmatically and symbolically, with commentaries, the philosopher's deductions from the diagrams. The *Li Chi*, or *Book of Rites*, a classic of ceremonial, also belongs to the earlier time (c. second century), and is ascribed to the elder and younger Tai. The fifth of the classics of Confucius (known as the *Five Ching*) is the *Ch'un Ch'iu* or *Spring and Autumn Annals*, being a chronology of events of the state of Lu, which was the state of Confucius. This book, which is somewhat dull, is notable for the inclusion of the *Tso Chuan*, a document which is described by a high authority as one of the most precious heirlooms of the Chinese people. Its value lies in the life and perhaps impudence with which Tso, its author, invested the raw material of the Annals. The most valuable works from which to reconstruct pre-Confucian culture are the surviving treatises on religion, rites, and ceremonial: the *Chou Li* (or *Rites of the Chou Dynasty*), the *Li Chi*, and the *I Li*, all most important sources which have not yet received the investigation they merit from students of history. Included in the Confucian Classics, besides the *Five Ching*, are also the *Four Shu*: the *Lun Yu* or the *Analects*, a compendium of the small talk of the sage, with dialogues of himself and disciples on gov., virtue, and similar topics; the *Chung Yung* or *Doctrine of the Mean*, by the grandson of the sage, being a eulogium of the tenets of Confucius; the *Ta-Hsueh*, or the *Great Learning*, a primer of Confucian ethics which has had a remarkable effect in shaping the Chinese national character; and *Mencius*, a treatise in four books on political economy. This last collection contains the sayings of Mencius, the greatest of the disciples of Confucius, and is remarkable for the writer's power of Socratic irony in refuting the Chun sophists of his day.

Between 600 and 200 B.C. there are numerous authors on a wide range of subjects, but even the expert may find it difficult to disentangle the forgery from the authentic work. Some of the most notable are the *Ping Fa* or *Art of War* of Sun Tzu; the work of Haun Tzu, the anti-Confucian philosopher; and the *Chia Yu* or *Family Sayings of Confucius*, generally ascribed to Wang Su, an official who died 256 B.C. The poetry of this period is of great interest. It is sonorous like so much of Chinese poetry, and has been described as 'prose run mad' (Giles). Its characteristics are its allegorical style and an excessive use of allusion; and, indeed, but for commentaries, more or less unintelligible; but, when interpreted, is a

good guide to the Chinese view of the poet's art. Opposed to Confucius at this early period is the complex but important literature of Taoism, or that which accumulated round the Tao or 'Way' of Lao Tsze (or Lao-Tzu) (i.e. Old Philosopher), whose biography is to be found in the hist. of Szu-ma Ch'ien, 'the Herodotus of China.' Much is merely legendary in the existence of Lao and in the identity of his work with the well-known *Tao Teh Ching*. Lao, or Laoctus to give the Latinised version of his name, is, indeed, so opposed to Confucius that some have believed the whole story of this religious



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LAO-TSZE AND HIS DISCIPLES

By Huang Shao-ming, 16th century

teacher to be merely a distorted version of the Buddhist legend. Some think that the *Tao Teh* or *Classic of the Way of Virtue* is a work of the second century, and that it really contains also many of the sayings of Confucius himself. More authenticated is the work of Ta Lao's disciple, Chuang Tsze, a writer who in a turgid style emphasises the idealistic character of Lao's doctrines with the unintended effect of enhancing the practical nature of the teaching of Confucius. Other Taoist philosophers are Lieh Tzu, whose works may be had from any Chinese bookseller to-day, Hunan Tzu, an alchemist, and Han Fei Tzu, a lawyer, whose essays are valuable in that they divorce the genuine sayings of Lao from the rest of the *Tao Teh*.

The literature of the Han dynasty (200 B.C. to A.D. 200) throws much light on Chinese national history of that period. It covers all branches from the poetry of Li Ling, a Han general known to every Chinese schoolboy, to history,

lexicography, and parables on Buddhism, which religion was then beginning to make its way into C. Poetry greatly flourished under the Han dynasty. The farewell poem of Su Wu, a military adventurer, to his wife on leaving for the wars, is well known in C. to-day; and there is an equally well-known poem, *White Owl Ode*, by Chia I., which bears a strong resemblance to Poe's *The Raven*. Among other writers of this period were Li Szu, known as the inventor of the 'Lesser Seal' style of script, so called because the characters were suitable for engraving on seals; Yang Hsiung, the author of *T'ai Hsuan Ching*, an apotheosis of the *Book of Changes*; Wang Ch'ung, whose essays *Lun Heng* give him the position of a Chinese Juvenal; Ching Hsuan, the most learned and voluminous of the commentators of the Confucian classics; and the poet Mai Cheng, who is notable as the father of modern poetry in the sense that his verse exemplifies for the first time the beauty of the five-word metre. The chief historian of the period was Szu-ma Ch'ien, the so-called father of hist. (b. 145 B.C., whose work, known as the *Historical Record*, is a hist. of C. from the earliest times to a century before the Christian era. Most subsequent dynastic records of C. have been based on his model. Another notable historian was P'an Chao, sister of the court historiographer, and 'ornament of her age,' who was made mistress of poetry and hist. by the empress in recognition of her *Book of Han*. Lexicography was raised to a science by Hsu Shen, a scholar who compiled the celebrated *Shuo Wen*, a collection of comments and expositions of some 10,000 Chinese characters, being a work of considerable importance in the study of ideographs. In the next period, that of the minor Han dynasty, the period of C.'s greatest romance, literature was lost in the fog of civil war, but the material was there for the most exciting narratives. The period, with its amazing generals, its quaint women, its almost incredible military exploits, is perpetuated in the celebrated *Story of the Three Kingdoms*, one of the most popular novels of the country. The names of sev. bards have survived, notably those of T'ao Ch'ien (A.D. 365-427), a poet of the school of Omar Khayyām, whose *Peach-blossom-fountain* allegory, on the futility of trying to rediscover the scenes of youth, is known to all Chinese students of poetry; and of T'ao Chih, a kind of Chinese Horace, who figures in the favourite Chinese story of *The Beans and the Beanstalk*.

Li Po (A.D. 705-762), of the T'ang period, is generally regarded as C.'s greatest poet. His life of gaiety, dissipation, and court intrigue is in itself a theme for verse; but his chief title to fame lies in the use he made of 'suggestion,' or the 'stop-short,' a literary device which is considered by the Chinese as of the very essence of true poetry. His muse is of the pensive vein and 'many of his Baochanallan verses are tinged with melancholy.' Another distinguished name of the time was that of Han Yu, the writer of

the celebrated *Memorial on the Bone of Buddha*, a statesman as well as a poet and scholar, and a most venerated name in Chinese literature. He wrote on a great variety of subjects, lifting the commonplace into something of interest by sheer wit. His poetry is not, however, of the first order, and it is through his prose that he lives, and his funeral orations are famous in Chinese literature, as is his allegory of a crocodile. Another poet of this period was Po Chu-I (772-846) a governor of Soochow and war president, whose poems were collected by imperial edict and engraved on stone tablets. Of this period, too, was Ssu-Ku'ng Tu', a court official of ceremonies who turned hermit; his chief work was a philosophical poem in the form of a scholarly exegesis of pure Taoism. The next or Sung period (A.D. 900-1200) is the period of speculative philosophy, and has also been called the period of neo-Confucianism. The cardinal feature of the literature of the Sung writers is a tendency to work Confucianism into the theory of gov. The chief names are Chao, Chu Hsi Chang, and the two Chengs. Chu Hsi is also known as the writer of a summary of some thirty-six centuries of Chinese hist. based on the work of Szu-ma Kuang. The latter, who flourished between 1019 and 1086, is famous alike as poet, historian, and statesman, and is said to have spent twenty years over his *General Mirror Aid in Governing*, and is also known for his poem *Garden*, of which a famous account is given in the pages of Abbé Huc, the ingenious Fr. missionary who wrote a famous work on his travels with Gabet in Tibet. With the Sung period came the invention of block printing which gave a great impetus to the production of hist., and general literature and poetry, besides the compilation of dictionaries and medical works; and among the other prin. names of the times are those of Wang An-Shih, an economist and educationist; Shao Yung, a Chinese Lucretius who deduced his explanations of natural phenomena from the groundwork of the *Book of Changes*; Wu Shu (947-1000), whose *Shih Lei Fu* on celestial and terrestrial phenomena, botany, and mineralogy is the parent of all the voluminous works of that type which have since figured so largely in Chinese literature; and Sung Tzu, a Chinese judge who wrote a book on *Medical Jurisprudence* which, though full of ludicrous absurdities, is the *vae-mecum* of Chinese coroners.

The Mongol dynasty (1300-68) added but little of lasting value to the vast accumulation of general literature, poetry, and commentaries thereto written; but it is notable for the rise in Chinese literature of the drama and of the novel. Most Chinese plays are simple in construction and poor in plot; they are classified into plays 'military' and 'civil,' the former comprising historical or heroic episodes and the latter farces on everyday life. Most are unexceptionable in tone, but 'gagging' metamorphoses them into the gross. The nearest approach in

Chinese drama to tragedy is the well-known five-act play *The Orphan of the Chao Family*, by Chi Chun-hsiang. The origin of the Chinese novel is not known, but it may be traced to Central Asian sources, whence have emanated stories current the world over. *The Hsi Yu Chi* or *Record of Travels in the West* is a favourite Chinese novel, written in a popular style, and treating of a journey in quest of books and images to illustrate Buddhism. Novels were written in considerable numbers at this period, but the names of the authors are buried in oblivion, no doubt because, generally speaking, the Chinese do not rate novels as true literature. Apart from the historical *genre*, Chinese novels comprise one really remarkable work, *Ch'in P'ing Mei*, attributed to Wang Shi-Cheng, a statesman, notable mainly for its recurrent use of the *double entente* throughout the story, which is concerned with three female characters whose names form the title. In drama, the *P'i Pa Chi*, or *Story of the Guitar*, is regarded as the very finest of Chinese plays. First performed in 1704, it was written by K'ao Tse Cheng, and, according to Chinese critics, its chief beauty is in its praise of duty to the sovereign, of filial piety, and of wifely forbearance. The poetry of Hsieh Chin (1368-1415) is well known in C.; he may be regarded as the Chinese Chatterton, for his precociousness of genius and of character, and, in his time, presided over the bodies which produced C.'s largest encyclopedia. It was in Yung Lo's reign that the *Great Encyclopedia* was produced; it is the bulkiest literary collection ever made, and is said to have required the unceasing labours of more than two thousand writers for three years. It was never printed, but copies were circulated in MS., and though most appear to have been lost in the Boxer outrages, MS. vols. are frequently being found, and the Library of Congress, Washington, now holds the largest number of them. Another notable work of reference of this time is the *Complete Geographical Record of the Empire*, in ninety vols. *Liao Chui*, or *Pastimes of the Study*, by P'u Sung-Ling (b. 1622), is admired by cultivated Chinese readers of to-day, despite the fact that it is of the order of novels. For years it was pub. only in MS., the author being too poor to have it printed. The stories in themselves are in no way remarkable, but 'all the elements of form which make for beauty in Chinese composition are there in overwhelming force,' and the work is proverbial for its commendable Tacitean conciseness, while the wealth of its allusions seem to point to the author as a man who had covered the whole range of Chinese literature. The love-story *Hung Lou Meng*, or *Dream of the Red Chamber*, also belongs to the Manchu period; this work reaches the zenith of development of the Chinese novel. Its author is unknown, but it is assigned to the latter part of the seventeenth century. It is voluminous both in size and in the number of its characters, and the characterisation is on a par with

that of the novels of any age or country. It gives a picture of Chinese social life which for comprehensiveness is quite unrivalled (a fairly complete account of it is to be found in H. A. Giles's *History of Chinese Literature*). The poetry of this period is commonplace, but the emperors of the time were good patrons.

Coming to more recent years, Yuan Mei (1715-1797) is C.'s most popular writer of modern times, his letters being witty and diverting, though often coarse; like so many Chinese works, they lose much by trans. Yuan Mei's work is replete with epigrams and aphorisms, and much commonsense philosophy. Other names of the Manchu period (ending 1900) are those of Ku Chiang (d. 1681), a writer on political economy and general literature; Chang T'ing Yu, author of a *History of the Ming Dynasty*; and Yuan Yuan, a most notable scholar (d. 1849), and a governor of Chekiang, who wrote copiously on astronomy and archaeology and classics, and compiled a biographical dictionary of the mathematicians of all ages. A feature in the life of any Chinese city is the wall-literature, which has strong affinities with journalism of the more utilitarian kind, including, as it does, official notices, specifics for diseases, and other notices. The existence of this wall-literature from the very earliest times was exceedingly fortunate, in that it proved the medium of rescuing the classics from permanent loss. Journalism proper is a late development, due to the influence of the foreigner, and by no means popular with the Chinese rulers. The first Chinese news sheet was pub. in Shanghai in the seventies by a syndicate of Brit. journalists and an Amer. Local officials tried in vain to suppress the sheets, and ultimately had to start their own papers in sheer self-defence. *The Peking Gazette*, sometimes said to be the oldest newspaper in the world, is not really a newspaper, any more than were the old Rom. *acta diurna*; it does not contain news in the common acceptance of the term, but only records of court movements, promotions, and some notices of edicts, etc., and is therefore very like the *London Gazette*. It began in the fifteenth century and is pub. daily.

It remains to add that interest in Chinese poetry has been enormously quickened in recent years by translations such as those of Arthur Waley (England), Amy Lowell (U.S.A.), Soulié de Morant (France), and Klabund (Germany), and that it is to Herbert A. Giles, Prof. of Chinese in the univ. of Cambridge, that we owe the first attempt made in any language, including Chinese, to produce a hist. of Chinese literature (1900).

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Chinese Art.—In painting the Chinese long ago attained a degree of excellence reached only by the greatest masters of the art. Chinese art was on a lofty plane centuries before the modern W. nations had learned even the elements of painting. The landscape painting founded by the Sung artists, in which mts. figure so conspicuously, is ranked as the greatest school of landscape painting the world has seen, its merit lying in the imaginative portrayal of the elemental and sublime in nature, while its 'visions of storm and peace among abrupt peaks and of plunging torrents,' though often fantastic, are never tame. It is a commonplace that great Chinese artists have no regard for outline as opposed to the spirit of the subject depicted, and Chinese art has languished in later centuries only because popular favour has veered to the productions of the studio artist as opposed to the artist of the plain air school. As in poetry (see *Chinese Literature*) so in pictorial art, the Chinese delight in 'suggestion' or leaving something to the imagination of the beholder, and Chinese artists found scope in 'Impressionism' centuries before that term became current in the Eng. language. Time-honoured stories, like that of the fruit painted so realistically by Zeuxis that the birds pecked at it, are paralleled in the literature of Chinese art; and exhibitions of Chinese pictures held in the present century show that the amazing stories of the power and originality of Chinese painting are justified.

Many examples of T'ang art are to be seen in the Brit. Museum to-day, mostly dealing with Buddhist subjects. In this, the 'golden age' of Chinese art, two schools of painting were founded; the N. by Li Shu-hsun, and the S. by Wang Wei. Robust sternness is the feature of the N., and exquisite refinement of the S. Besides the above painters, the greatest painter of the T'ang period was Wu Tao-tzu, the most revered figure in Chinese art, and celebrated as the father of modern Jap. painting. Apparently no paintings of his are extant, but 'The Death of Buddha,' in the Brit. Museum, founded on one of his reputed masterpieces, affords a clue to his powers. Chinese painting in these earlier periods owes much to Chinese poetry, the religion of Taoism, and the Zen form of Buddhism, to all of which influences may be attributed its predominantly symbolic or suggestive

spirit. Among other notable Sung artists were the Emperor Hui-tsung, famous for his pictures of white falcons, and Li Lung-mien.

Ming art, too, is of the highest merit, especially the bronze work of the fifteenth century, which produced the incense-burners known as 'Jisu Lu.' Ming lacquer work and porcelain are also known the world over, the latter being remarkable for the device of coloured glazes and painting beneath the glaze.



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'GODDESS OF THE DEW'

By Wan Shou-ch'i, 17th century
(British Museum).

The Kaolin Hills, indeed, are named from the clays from which the famous porcelain is made. As regards porcelain, the Ch'ien Lung era was the most prolific in the hist. of Chinese art, and modern W. collections consist largely of specimens of that period. The celebrated imperial potteries of Chingtehchen and Kiukiang, estab. under the experts T'ang kung and Nien, maintained their reputation until the time of the Tai-ping rebellion in the nineteenth century, when they were closed, but there has since been a revival of the art. The Chinese have also excelled in the carving of jade, a light or dark green stone into vases and other objects for ornamental purposes. See J. C. Ferguson, *Outlines of Chinese Art*, 1920, and *Chinese Painting*, 1927; U. Pope-Hennessy, *Early Chinese Jades*, 1923;

A. J. Coop, *Early Chinese Bronzes*, 1924; W. G. Gulland, *Chinese Porcelain*, 1928-1929; L. Binyon, *Paintings in the Far East*, 1934; G. Rowley, *The Principles of Chinese Painting*, 1947; W. Cohn, *Chinese Painting*, 1948.

China Aster, ann. herb of the Compositae order; botanical name, *Callistephus chinensis*. It originates in China, being introduced to Great Britain in 1731, and has lilac flower-heads.

China Bark, one of the names applied to the bark which yields the drug cinchona.

China Clay, see KAOLIN.

China Grass, see BOEHMERIA.

China Ink, see INK.

Chinandega, in Nicaragua, tn. consisting of two contiguous tns., Old C. and New C., important as being the centre of a corn-producing dist. owing to its situation on the Corinto-Managua railway. Trade in cloth, pottery, cotton, Indian feather ornaments, sugar-cane, bananas. Pop. 12,000.

Chinan, see TSINAN.

China Root, name given to the root of the tropical vine, *Vitis sicyoides*, and also to that of the lilaceous plant, *Smilax China*. The latter plant is used medicinally, and others of its genus yield sarsaparilla.

China Sea, South (Chinese Nan Hai, or South Sea), that portion of the Pacific Ocean lying to the E. of China and Slam, being bounded by China and Formosa on the N. and N.W., the Philippine Is. on the E., Borneo on the S., and the Malay Peninsula and Fr. Indo-China on the S. and S.W. It forms the great gulfs of Slam and Tongking. Its chief affluents are the Rs. Meinan, Cambodia, Canton, Mekong, Songkoi and Sikiang. The chief ports are Canton, Manila, Bangkok, Singapore, Hong Kong, and Saigon. Greatest depth, 14,250 ft.

Chinaware, a porcelain, a kind of fine earthenware, made by mixing china clay with undecomposed felspar (petunite), and some sand or silica. The resultant porcelain is pure white when fired because china clay contains no iron. The art of making C. was introduced into Europe by Venetian travellers from China in the fifteenth century, and for three centuries thereafter Italy was the centre for its manu. The famous Sèvres factory was founded in the middle of the eighteenth century, and about the same period factories were set up at Chelsea and Worcester in England. See further under PORCELAIN.

Chincha Islands, three small rocky is. in the Pacific, off Peru, and about 14 m. from the coast. Total area $\frac{1}{4}$ m. The is. rise to about 200 ft., and were formerly noted for guano, but have now been worked out. Lat. $13^{\circ}38'S$; long. $76^{\circ}28'W$.

Chinohay-cocha, lake of Peru, lying to the S. of Cerro de Pasco. Altitude, 13,800 ft.; length, 18 m.; breadth, 6 m. Discharges its surplus waters at the N.W. corner by the Mantaro R.

Chinshew see CHUANCHOFFU.

Chinchilla, tn. of Spain, in the prov. of Murcia, with industries of lead mining and cloth manufs. Pop. 7320.

Chinchillidae, family of rodent mammals estab. by Bennett, consists of sev. genera of S. Amer. animals allied to the agouti (q.v.). All the species have long limbs, bushy tails, very soft hair, and resemble squirrels to some degree. *Chinchilla laniger* is the true chinchilla, a little creature with large eyes and ears, and its fur is so much sought after that it is diminishing in numbers. In habit it is gregarious and subterranean, and in disposition it is mild. *Lagidium* is another genus which has its habitat in the higher Andes, and the third genus consists of one species, *Lagotomus trichodactylus*, the vizcacha.

Chinchon, tn. of Spain, situated 25 m. to the S.E. of Madrid. Pop. 5000.

Chinde: 1. Riv. of Portuguese E. Africa, in reality the chief of the estuarine branches of the Zambesi, which empties into the Indian Ocean about lat. $18^{\circ}30'S$. The mouth is more or less blocked with sand. 2. Seaport of Portuguese E. Africa, at the mouth of the Chinde R. It is the chief port for the Zambesi Valley, though large steamers cannot cross the sand-bar at the riv. mouth, over which there is only a depth of 10 to 18 ft. of water. The tn. has only come into being since 1889. In 1891 the Brit. leased from the Portuguese five (later twenty-five) ac. of land known as the Brit. Concession, on which goods in transit to Brit. possessions may be stored duty free. Pop. 1500 natives and 200 Europeans.

Chindwara, see CHINDWARA.

Chindwin, or Kyendwin: 1. Riv. of Upper Burma. Rises in the Patkoi Mts. near the Assam frontier, and flows in a southerly direction for about 500 m., joining the Irawadi on the r. b. between Mandalay and Pagan. It is navigable by steamers up to Kindat, and by native boats for about 300 m. in the wet season and about 150 m. in the dry, but navigation is rendered difficult by the sandbanks and the swiftness of the current. In the operations in Burma in 1943-44, Gen. Slim had available the 4th Indian Corps for an offensive, if necessary, up to and beyond the Chindwin R. and the Chin Hills. On March 16 (1944) the Jap. gen. Mutaguchi's Fifteenth Army crossed the riv. with the intention of reaching Imphal and Kohima before allied reinforcements could arrive and then to break into the Brahmaputra Valley. But the 5th Indian Div. was flown up from Chittagong and two brigades were landed at Imphal, where they formed the necessary reserve. The Jap. were heavily defeated at Kohima and Imphal and the remnants of their 31st and 15th Divs. were driven back across the Chindwin R. by the 33rd Corps. By summer the Allies reached the junction of that riv. with the Irawadi and the advance on Mandalay was begun. See further under BURMA, SECOND WORLD WAR CAMPAIGNS IN. 2. Name given to two dists. in Sagaing, Upper Burma. The upper dist. is mountainous and covered with forest. Area 16,037 sq. m. Cap., Kinday. Pop. 200,000. The lower dist. is partly wild and wooded and partly a fertile rice-producing plain. Area

3480 sq. m. The cap. is Monywa. Pop. 345,000.

Chinese Eastern Railway, The, is a railway of about 1100 m. in length, running S.E. across the N. part of Manchuria. It enters Manchuria on the W. at Manchuli, and on the E. it joins the Ussuri railway, running to Vladivostok, at Pogranichnaya, or Sulfenho. It has a branch running S. from Harbin and joining the S. Manchuria line at Changshun. The line, which is of the standard Russian gauge of 5 ft., was built mainly by Russian and Fr. capital, though the Chinese Gov. have a small holding in its stock. With the possible exception of the Bagdad railway, no other railway has been such a bone of contention among diplomats. The weakness of the Russian Gov. after the First World War emboldened the Manchurian Gov. to make claims which would not have been put forward against the gov. of the tsar. This dispute came to a head in 1929 and led to military conflict at each end of the line. In 1935 the Russian Gov. sold the entire system to the Jap.-controlled Gov. of Manchuria, or Manchukuo.

Chinese Labour Question, The. Hist. of the C. L. Q. which so agitated the public mind in S. Africa and Great Britain during the first decade of the present century may be traced back to the pre-Boer days. The gold-mine owners of the Rand (Transvaal), in giving evidence before a commission appointed by the Boer Gov. (1897), had demanded cheaper coloured labour to work their mines. They pointed out that certain low-grade ores could be profitably mined if the gov. would increase the native hut tax and consent to the estab. of locations in order to compel the Kaffir to work at reduced wages. They further argued that with an increased supply of native labour more white labour would be employed. On the commission reporting adversely on these suggestions, the mine owners talked of the importation of Asiatic labour and of closing down the mines if their demands were refused. President Kruger replied by passing a law which provided that if the mines were not worked by the mine owners, the gov. would confiscate them and work them itself. Then came the war (1899-1902) in which the Kruger Gov. was swept away and the Milner regime estab. One of the first acts of Lord Milner was to double the hut tax. At the close of the war the mine owners reduced native wages from 47s. a month to 27s., with the result that at that time only 42,000 natives were working, as against 90,000 at the beginning of the war. On their raising wages next year to their former level, the natives flocked back until their numbers were the same as before the war. In 1903 Lord Milner appointed a commission to inquire into the adequacy or otherwise of the sources of supply of labour for the mines. This commission reported that an additional 129,000 labourers were necessary, and that Central and S. Africa were unable to meet this demand. In the following year an ordinance was carried in the Transvaal

Legislative Council for the introduction of indentured labour 'from outside Africa S. of 12° N. of the equator.' This ordinance, which received the royal assent, was strenuously opposed by the Liberal party in Great Britain and by the Boers and white labourers in the Transvaal. On the other hand, it was claimed that a petition in favour of Chinese labour was signed by a little over half of the white adult pop. The opinion of Cape Colony may be gauged by the fact that in May 1904 a Bill was passed in the legislature excluding Chinese labour from that colony. The first shipload of Chinese coolies arrived at Durban on June 20, 1904, and ultimately as many as 60,000 coolies were employed on the Rand. The strong feeling raised in Great Britain against the employment of Chinese labour, freely characterised by opponents as 'Chinese slavery,' was, it is generally conceded, mainly responsible for the overwhelming defeat of the Conservative party at the general election in January 1906. On the granting of a constitution to the Transvaal the Het Volk (or Boer) party obtained a majority in the new chamber, and this party proceeded to redeem its pledge to repatriate the Chinese speedily. Thus 17,000 left in 1907, 28,000 in 1908, and the remainder in 1909. The many parl. debates on the subject of Chinese labour gave rise to two or three phrases that will probably be remembered when the occurrence on which they were uttered has been forgotten. Thus we have the archbishop of Canterbury's defence of the ordinance as a 'regrettable necessity,' and Mr. Winston Churchill's characterisation of the term 'Chinese slavery' as a 'terminological inexactitude.'

Apart from the C. L. Q., no large number of Chinese have entered the Brit. Empire, though some thousands, lured by the gold-fields, went to Australia and increased the total by the middle of the century to about 50,000. Political trouble ensued, and the numbers went down steadily, and by 1930 were less than half what they were, a result chiefly due to the Australian immigration tests. A high head tax excludes them from Canada and a poll-tax has the same effect in New Zealand.

Chinese White, condensed form of the pigment known as zinc white. This is an oxide of zinc (ZnO) which is manufactured by combining vaporised metallic zinc with air, when the pigment is deposited as a white powder. C. W. is not liable to chemical or physical change, and is practically inert with regard to other pigments. It forms an excellent water-colour, but lacks toughness with oil.

Chingapat, Chengapat, or Chingleput, chief tn. and stronghold of the dist. of that name in Madras, India, and of historical importance since one of its forts was taken by Clive in 1752. The dist. comprises 2842 sq. m., and has a pop. of 1,500,000; the tn., 36 m. from Madras and noted for its pottery, 15,000.

Chingchu, or Tsinchow: 1. Tn. of Shantung prov. in N.E. China, 80 m. E. of

Tsinan. The former cap. of the prov. and a centre of the silk trade. 2. Tn. of Hupeh prov., China, near Shashi.

Chingford, suburb of London in Essex, England, situated between the R. Lea and Epping Forest. 10 m. from London. Pop. 22,000.

Chingsha, or **Kinshakiang** (riv. of golden sand), Chinese name for the upper course of the Yangtzekiang, rising in the mts. of the Kunlun system, dividing the prov. of Sikang. It is separated by mts. from the Rs. Hwang Ho and Mekong.

Chingtzukuan, tn. of Honan, China, on Tan R. Of considerable commercial importance, being at the head of winter navigation on the riv. and on the Hankow to Sianfu trade route.

Ch'ingwangtao, port of N. China in the prov. of Hopei. It owes its existence as a port to the Chinese Engineering and Mining Co. Ltd., now known as the Keilan Mining Administration. As a seaside health resort it is almost without rival in China. The glass factory is one of the largest in existence. Pop. 5,000.

Chingyangfu, tn. of Kansu, China, on Matien R.

Chini, tn. of Bashahr, W. Punjab, India, near R. Sutlej, 69 m. N.E. of Simla. Vines are largely grown. Pop. about 5,000.

Chiniot, tn. of Jhang dist., E. Punjab, Pakistan, near R. Chenab, 80 m. N.W. of Lahore. Noted for wood-carving and masonry. Pop. 13,500.

Chinkiang, port in the Kiangsu prov. of China on the S. bank of the Yangtze, about 150 m. from its mouth. Its existence as a port is gravely threatened by the deterioration of the harbour. There is an Amer. Presbyterian Mission station. Pop. 200,000.

Chinlin Mountains, branch of the Kunlun Mts. in China, dividing the Wei and Han Rs. in their upper courses. Its highest peaks are in the Tapaishan and Kwangtangshan, both upwards of 12,000 ft. high. This range has sev. important passes, of which the chief are those connecting Sian and Shanchow with Lunchow and Fengsiang with Kuang-yuan.

Chinnampo, port in Korea, 40 m. from Pinyang, has a pop. of 30,000. Rice, beans, wheat, cow-hides, and timber are exported.

Chin-India, see INDO-CHINA.

Chinan, see TSINAN.

Chino-Japanese War (1891-95). Jap. interest in the integrity of Korea, which country her commercial enterprise had opened up to the world, was the real cause of this war. Its immediate cause, however, was the violation of an agreement made between Li Hung Chang (q.v.) and Count Ito (q.v.) for maintaining the *status quo*, by the despatch of Chinese troops to Korea without due notice to the Jap. Gov. Other and contributory causes were: the murder of Kim Okkuin, the Korean statesman, in Shanghai, whither he had been inveigled by Korean delegates; Jap. commercial grievances of ten years' standing; and the prevailing unrest in Japan, whose statesmen saw in such a war a practical solution of their difficulties.

But whatever the causes, the resulting and thorough defeat of the Chinese was a startling revelation of the rise of new world power in the Far E., although the promulgation of the enlightened Jap. constitution of 1889 should of itself have shown that Jap. progress in W. ideals was no transient phase. Japan's first opportunity of interference in Korean affairs was the earlier embroilment of China with great foreign govts. through disorders in Korea, of which country China was the nominal suzerain; and Japan then secured a treaty with China involving the independence of the principality. The Chinese Gov. then sought to retrieve the position by intrigues, which soon brought the two countries to the brink of war, troops from both being already in Korea. Then followed a number of tragic incidents, which compelled Li Hung Chang to arrange a *modus vivendi* with Count Ito, under which the troops on both sides were withdrawn; but the agreement was broken in the manner above indicated, and war was declared by Japan on Aug. 1, 1894, actual hostilities having begun a week previously with the sinking of the transport *Koeshing*, an Eng. vessel carrying Chinese troops. In the battle of P'ingyang (Sept. 15), a Chinese army was routed with heavy loss. Chinese methods of generalship being grotesque in the extreme. On Sept. 17, however, the Chinese navy fought stoutly at the battle of the Yalu, but lost sev. ships. Late in Oct., a Jap. army under Count Oyama (q.v.) invaded Manchuria. The fortress of Port Arthur was taken by storm on Nov. 21, with only slight loss to the Jap. who, however, marred the previous record of their humane advance by an unwarranted massacre. But the advance was so successfully prosecuted that the Chinese Gov. sent one Detring, an Eng. employe in the Chinese customs service, to open peace pourparlers. Like many other emissaries in the course of the war, he was not recognised. Haicheng and Kaiping then fell to the Jap., these victories giving them complete control of the Liaotung peninsula; and in Feb. 1895, at the decisive battle of Weihaiwei, the Chinese land and sea forces were utterly defeated, the Chinese admiral Ting, committing suicide in his ship. The Jap., continuing to advance, now closed on Peking, with the result that Li Hung Chang himself departed for Tokyo to conclude peace. A treaty was signed at Shimonoseki in April and ratified in May at Chifu, under which Korean independence was recognised, and Liaotung, Formosa, and the Pescadores were ceded to Japan. Other terms included the opening of ports in Szechuan, Hoopoh, and other provs., and a large indemnity to Japan. Later, however, Japan was induced by France, Germany, and Russia to give back Liaotung in exchange for an increased indemnity.

Chino-Japanese War, 1931-33. See CHINA. History: Events in the decade before the Second World War.

Chinon, anc. tn. in the dept. of Indre-et-Loire, France, on the R. Vienne. On

the hill which overlooks it are the remains of three castles or of three separate strongholds constituting one castle: the Château de St. George's, built by Henry II. of England, very little of which is extant; the Château du Milieu (or middle stronghold), twelfth to fifteenth centuries, where Charles VII. first gave audience to Joan of Arc; and the Château du Coudray, tenth to thirteenth centuries, the chief remains of which are the Moulin and two later towers. There are three remarkable churches, of which one dates in part from 1025 to 1050. Clovis wrested C. from the Visigoths. From 1044 it belonged to the counts of Anjou, the Plantagenets, who became kings of England, but Philip Augustus gained it from Henry II.—who d. at C.—and it remained thenceforth with the kings of France. Rubelais was b. at the farmhouse of La Devinière in the vicinity, his own house being in the Rue de la Lamproie. Pop. 5500.

Chinook, warm dry wind blowing over the slopes of the Rocky Mts. It is a local wind similar to the *Föhn* of the Alpine valleys, and is due to a cyclone passing northwards and lasting from a few hours to sev. days. The dynamic pressure to which the air is subjected in passing to a lower level is the cause of its dryness and warmth. It is felt as a cool wind in summer, and in winter it causes the snow to disappear from the E. Rockies.

Chinooks, aboriginal tribe of Amer. Indians living in the extreme N.W. of the U.S.A. The tribe is now nearly extinct, numbering only about 600 persons, and inhabiting a small area on the Columbia R. in Washington. The C. were formerly great traders, bartering with the interior tribes the articles they obtained from the white skippers. The useful 'Chinook jargon' came into being as a means of communication rendered necessary by this commerce.

Chinquapin, or *Castanea pumila*, Amer. species of Fagaceæ closely allied to the chestnut. The plant is smaller than the common chestnut, and the fruit is also edible.

Chinsura (Chinsurah), formerly a tn. of India, Bengal Presidency, on R. Hugli, now forming one municipality with Hugli, 24 m. from Calcutta. It is the seat of Hugli College. From 1656 to 1824 the chief Dutch settlement in Bengal, ceded to the Eng. with other places in exchange for possessions in Sumatra Is. Pop. with Hugli 30,000.

Chintz (Hindu *chint*, Beng. *chit*, from Sans. *chitra*, spotted, variegated), originally the name of pieces of printed calico or cotton fabric from India, each piece being a 'chint.' The name was later applied to a highly glazed, printed calico of home manuf., with a many-coloured pattern of flowers or birds on a light background. C. is used for curtains, furniture coverings, etc. Dust does not adhere to its calendered surface. See also CRETONNE.

Chinú, tn. of Colombia, dept. Bolívar, 95 m. from Cartagena. Valuable treasure was found here by Heredia in the tombs of the Indians. Pop. (dist.) 10,000.

Chinwangtao, modern treaty port of China on the gulf of Pechili. It is still administered by the Kailan mining administration. The port, which is ice free, has a tidy and busy appearance. Since Dairen is still under Russian control and closed to foreign and Chinese shipping, C. has become the chief port for Manchurian products, especially soya beans. Some 11,000 persons are employed by the port administration. Pop. 20,000.

Chiococca, genus of Rubiaceæ which consists of seven species, all occurring in tropical America. The root of sev. of these plants is possessed of emetic properties, and *C. anguifuga* is used by the natives as a remedy for snake-bites.

Chioggia (Chiozza), episcopal city and fortified port of Italy, 18 m. from Venice, 63 from Padua. It is built on piles on an is. in the S. of the Venetian lagoon, surrounded by the Lombard Ship Canal, cut in two by the Vena Canal. A stone bridge of 800 ft. with forty-three arches connects it with the mainland, and a mole, built 1774-82, protects it from the Adriatic. Internal trade is carried on by means of the Rts. Adige, Po, Brenta, and by canals. The Board of Trade building (medieval corn-hall) dates from 1322, the cathedral from 1633. Fisheries are important, flax-spinning and shipbuilding are carried on, and sail, lace, candles, and bricks manufactured. The Lat. name was Fossa Clodia, medieval Clugia. In 1379 Venice conquered the Genoese fleet off C. C. fell to the Allies in April 1945. Pop. 33,000.

Chionea, genus of Diptera in the family Tipulidæ, has sev. peculiar features, and the species are destitute of wings. *C. arancoides* has been found in the woods of Sweden and the mts. of Austria when both were covered with snow, the insect showing itself only in cold weather.

Chios, Gk. is. and port in the Ægean Sea, 8 m. off the W. coast of Asia Minor at the entrance to the gulf of Smyrna. It is 32 m. long, varies in length from 8 to 15 m. and has an area of 320 sq. m. Pop. 75,000. The scenery is very striking and the soil fertile—grapes, oranges, and lemons, figs, olives, and other fruits growing in abundance. Mastic or gum resin is a noted product. Antimony is mined and marble quarried. C. claimed to be the bp. of Homer. In literature the chief glory of the is. was the school of epic poets called Homeridae, whose task it was to hand down the Homeric text. Volisso (formerly Bolissus), the tn. in which these poets lived, is still extant. C. is famed for its sculptors and the long succession of Chian sculptors in marble from Melas to Bupalus and Athenis testifies to the fame of Chian art in the seventh to sixth centuries B.C. Six m. N. of the tn. of C. is a curious monument of antiquity called 'the school of Homer'; it is an anct. sanctuary and altar built to the goddess Cybele, whose statue, with two lions, is chiselled in the rock. At Cape Phanæ, the S. extremity of the is., is a harbour and the remains of a temple of Apollo. C., the cap. of the is., is on the E. coast. It

has always borne the name of the is. It has a harbour, a cathedral, and the ruins of a citadel. It is a thriving tn. and manufs. silk and woollen goods. Pop. 26,000.

The hist. of C. is most obscure and the early relations of the is. with other states conjectural. According to Pausanias the is.'s king, Hector, united it to the Ionian confederacy, but from Strabo it might be inferred that it was conquered by Ionian colonists. The Chians seem, however, to have been allies of Miletus and hostile to the Phocæo-Samian alliance, to which the neighbouring is. Erythræ belonged. The Chians took part in the Ionian rebellion against the Persians (500-495 B.C.) and supplied 100 ships. After the Persian victory at the battle of Lade, C. was unmercifully treated, the tns. and temples razed and many inhab. sent into slavery. After the battle of Mycale (479 B.C.) the is. became free with a democratic form of gov., in place of the tyranny. C. was the strongest state after Athens in the Delian confederacy and it was an ally, on an equal footing, of the Athenian empire, tribute-free but supplying ships in time of war. Later the Chians joined the Lacedæmonians but, though their fleet was defeated at Solissus and in two other battles, the Athenians could not conquer the is. In the Mithridatic wars C. leaned to alliance with Rome but, following defeat, a large number of the Chians were carried to slavery in Pontus. C. had, however, many centuries of peace and prosperity under both Rom. and Byzantine rule. The Genoese held the is. from the fourteenth century to 1566 when the Turks took it and, except for a brief occupation by the Venetians in 1694, it remained in Turkish possession until the First World War when it became a Gk. is. During the Turkish occupation there were sev. massacres, notably one in 1822 as a reprisal for a revolt of some of the inhab. In 1881 the is. was devastated by an earthquake, in which some 50,000 people perished.

Chiozza, see **CHIOGGIA**.

Chippiez, Charles (1835-1901), Fr. architect. His architectural productions are comparatively few, but include one of the five monuments (1872) commemorating the siege of Paris (1871), and the École Nationale d'Armentières (Nord), 1885-88. He is chiefly noted for his writings on the hist. of art. *Histoire critique des origines et de la formation des ordres grecs* appeared in 1876. Joint author with Perrot of *L'Histoire de l'art dans l'antiquité* (8 vols.), (1881-1904), a most valuable work; and of *Le Temple de Jérusalem et la maison du Bois-Liban* (1889).

Chiplun, small tn. of India in the Bombay Prov. situated about 20 m. inland, and 75 m. S. of Bombay.

Chipmunk, or *Tamias striatus*, species of ground squirrel common to N. America, and belongs to the family Sciuridae. It is a pretty creature, differing from the common squirrel chiefly in having large cheek-pouches and a shorter tail. Its diet is strictly vegetarian.

Chippendale, Thomas (c. 1718-79),

famous cabinet-maker and upholsterer of the eighteenth century. He came to London from Worcester with his father, a well-known cabinet-maker and wood-carver, and ultimately estab. himself with his factory in St. Martin's Lane. C.'s work is characterised first of all by solidity without heaviness; his ribbon-backed chairs are perhaps his most successful work, and next to these his settees of two or three conjoined chairs. He pub. *The Gentleman and Cabinet Maker's Director*, containing his own designs and descriptions. See R. W. Symonds, *Chippendale Furniture Designs*, 1948.

Chippenharn, tn. on the l. b. of the Avon in Wiltshire, 22 m. from Bristol. One of its bridges across the riv. has twenty-one arches. It has a weekly corn market and an ann. cattle show. It has bacon-curing factories, and its manufs. include condensed milk and broadcloth. There is a causeway 4½ m. long which since 1474 has commemorated Maud Heath, a benefactress. The founder of the Muggletonians was born here. This tn. is of historical interest, because it was occupied by the Saxon kings in Wessex, and King Alfred was forced to flee from the city when surprised by the Danes. Pop. 8500.

Chippewa Falls, city of Wisconsin, U.S.A., co. seat of C. co., on R. C., 85 m. from St. Paul (Minnesota), 12 m. from Eau Claire. It is on the Wisconsin Central and other railways. There are many foundries and mills (for flour, wool, lumber, etc.), worked by the waters of the riv. Tone Rock battle-ground is near, and the city is noted for its pure spring waters. Chartered as a city 1870, it has its own mayor and tn. council. The State Home for the Feeble-minded and the Co. Insane Asylum are situated here. Pop. 10,300.

Chippewayans, numerous tribe of Amer. Indians of the great Algonquin stock, now settled in almost equal numbers in Minnesota and in Canada, but formerly inhabiting Wisconsin. Their name is written also Objibway, Otchipwe, and Objibway, a term which may possibly refer to the 'puckered up' appearance of the front seam of their mocassins. They were the hereditary and inveterate foes of the Sioux and the Foxes, whom, with the help of guns purchased from Fr. traders, they drove out of their habitat, and themselves became masters of an extensive ter. They now number about 28,000, of whom about 12,000 are in Canada. In person they are tall, active, and well formed. They fish, hunt, gather wild rice and cranberries, manuf. maple sugar, weave baskets and mats, and prepare birch bark for canoes, etc.

Chipping Campden, mrkt. tn. in Gloucestershire, England, 9 m. from Evesham. Formerly a thriving centre of the woollen industry. Has a fine Perpendicular church. Pop. 1800.

Chipping Norton, anot. Cheppingnorton, a municipal bor. and mrkt. tn., 25 m. by rail N.N.W. of Oxford. It consists of one large street with a fine Gothic church. Woollen and glove factories brewing and agric. trade. Pop. 3500.

Chipping Sodbury, small mkt. tn., 11 m. N.E. of Bristol. Pop. (tn.), 1100; (rural dist.), 24,500.

Chipping Wycombe, see WYCOMBE.

Chiquichiqui Palm, or *Leopoldinia Passaba*, Brazilian palm noted for the good fibre obtained from its bast. The passaba fibre is used in brush-making and the leaves in thatching.

Chiquimula: 1. E. dept. of Guatemala. Pop. 95,000. 2. Cap. of above, ant. city, 65 m. from Guatemala. The ruins of C. Antigua, destroyed by earthquake in 1773, are near. It has an active trade. Pop. about 25,000. 3. Isthmus of Central America on Caribbean Sea, between mouth of the Motagua and the corner of Honduras Bay.

Chiquinquirá, city of S. America, in dept. of Boyacá, Colombia, 44 m. from Tunja, 80 m. from Bogotá. Noted for its chapel with a miraculous picture of the Virgin, annually visited by thousands of pilgrims. Every seventh year there is a special public celebration. Has cattle-grazing and trade. Pop. 22,500.

Chiquitos, group of Amer. Indian tribes dwelling in the prov. of Santa Cruz de la Sierra, Bolivia, and about the head-waters of the Rs. Mamore and Itenez. They are well built, powerful, and of middle height, with bronze complexions, low foreheads, large round heads, and small bright eyes; they are hospitable, kindly, cheerful, and fond of music and dancing. They live in vils. founded by Jesuit missionaries, whom they willingly received in 1691, and who rapidly converted and civilised them. Since the expulsion of the Jesuits in 1767 they have degenerated considerably. They number about 20,000, and live in adobe houses thatched with grass; they are principally engaged in weaving ponchos (a kind of blanket cloak) and hammocks, manufacturing copper boilers for sugar making, and straw hats.

Chira, or *Cheera*, tn. of Sinkiang, China, 50 m. E. of Khotan. The Gobi Desert skirts it about 3 m. to the N. Pop. about 40,000.

Chirála, tn. of Madras, India, Kistna dist., 70 m. from Masulipatam. Pop. 10,500 (chiefly Hindus).

Chirayta, or *Chiretta*, *Ophelia* (or *Agathotes*) *Chirayta*, Indian species of Gentianaceae. The plant is extremely bitter, and when at its best it is gathered, dried, and the drug C. is extracted from it. It acts as a stimulant and tonic, and in India it serves as a febrifuge.

Chiriqui, prov., riv., lagoon, and archipelago of Central America, in W. Panama, Colombia. The riv. flows into the lagoon, which is situated in the Mosquito Gulf, and separated from the Caribbean Sea by C. Archipelago. The lagoon has three entrances, Boca del Drago, del Toro (on each side of Isla del Drago) in N.W., Boca del Tigre on E., and is navigable for the largest ships. It extends 90 m. along the coast, and 40 to 50 m. inland. The prov. has lofty volcanic peaks (C., about 12,000 ft.) and a fertile soil. Tobacco, sugarcane, and bananas are grown. Cap., David. Pop. about 77,000.

Chirk, par. and vil. in Denbighshire,

9 m. from Wrexham, on the W. Region railway. Has a famous castle, the seat of Lord Howard de Walden and, previously, the home of the Myddelton family. The original castle was built in the eleventh century, the later, a fourteenth-century building, being restored in the seventeenth century. In the vicinity are slate quarries and collieries. Pop. 2000.

Chiromancy, see PALMISTRY.

Chiromo, or *Chilomo*, vil. and trading-port of Nyasaland Protectorate, at confluence of Rs. Shire and Ruw, 55 m. from Blantyre. The Shire Highlands railway here crosses the Shire.

Chiromys Madagascariensis, see AYE-AYE.

Chiron, or *Cheiron*, one of the Centaurs, son of Cronos and Philyra, a sea nymph. C. was wise and just, while the other centaurs were uncivilised and fierce. He was the instructor of Actæon, Jason, Castor, Achilles, and other celebrated (Gk. heroes; he taught Asclepius the art of healing. He was accidentally wounded by a poisoned arrow shot by his friend Heracles. To free himself from the pain caused by the wound he renounced his immortality in favour of Prometheus, and was set among the stars as the constellation Sagittarius.

Chironectes, water opossum, a genus of marsupials, is represented by one species which inhabits S. and Central America. It is about the size of a rat, has webbed hind feet, and feeds upon fish.

Chironomus, chief genus of the midge and gnat family or Chironomidae, contains over two hundred Brit. species. The perfect fly is two-winged, and the blood-red larva is often called a blood-worm by anglers, who use it when fishing. It dwells in mud and forms food for birds and fishes. The swarms of little grey flies which dance actively above water on summer evenings belong to this genus.

Chiroptera, see BAT.

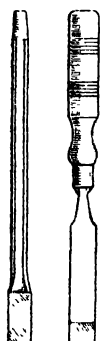
Chirotes canaliculatus, worm-like lizard of the family Amphisbenedæ, forms in itself a genus, and bears the proud distinction, wanting in all its relations, of possessing two small anterior limbs each with two toes. The C. is to be found in Mexico, and in length it varies from about 8 in. to 1 foot.

Chiru, or *Pantholops*, Tibetan genus of antelope comprising two species. The animal is pale fawn in colour with woolly hair; the male alone has horns, and these are long, straight, ringed, and gazelle-like. It is nearly 3 ft. in height, and is so swift and alert that great difficulty is experienced in its capture.

Chirus, genus of acanthopterygious fishes, is common to the seas of Kamchatka. They are shore fishes with sev. lateral lines, and belong to the family Heterolepidotidae or Hexagrammidae.

Chisel (Middle Eng. *chisel* or *chesil*, from O.F. *cisel*), tool used in carpentry and metal work, consisting of a blade with a bevelled or sloped cutting edge at one end and a handle at the other, which is prepared either for the grip of the craftsman's hands or to receive the blows of a hammer.

Cs. differ widely in shape and purpose, and receive their name according to their use or shape. Thus, there is the *cold chisel*, which is used for cutting unheated metal and stone. It has its cutting edge sharpened on both sides, and is formed of highly tempered steel. It is driven by a hammer. Carpenters' Cs. are driven by hand or by blows from a mallet. The ordinary implement is wooden-handled, and the blade is bevelled on one side only, the bevelled face meeting the flat side at an angle of about 20 degrees. Stone-masons' Cs. are bevelled on both sides and vary considerably in shape, the *boasting chisel* is used for roughly dressing the surfaces of stones. The *carving chisel* is one of the most delicate of these instruments. It is bevelled on both sides, and the two faces meet at an extremely acute angle, that it may lightly cut the wood without crushing it out of shape. The *spoon-chisel* is a bent instrument, bevelled on both sides, used by sculptors. Among other



CHISELS

varieties may be named the dental C., the turning C., the mortise C., and the ripping C. Certain Cs. with semi-circular blades used for gouging, are generally known as 'gouges.'

Chishima (Thousand Isles), Jap. name of the Kurile Is. (q.v.), U.S.S.R. extending from Kamchatka to Yezo.

Chisholm, mining tn. of St. Louis co., Minnesota, U.S.A. Pop. 10,000.

Chisholm, Alexander (c. 1792-1847). Scottish painter, early apprenticed to a weaver, went to Edinburgh about 1812, becoming teacher at the Royal Scottish Academy, under the patronage of the earls of Elgin and Buchan. He moved to London, 1818, exhibiting at Royal Academy, 1822; associate exhibitor of Water Colour Society, 1829. His chief works were historical groups and portraits. He also did illustrations for the Waverley novels. Among his works are 'Boys with a Burning Glass' (1822); 'Shakespeare before Sir Thomas Lucy' (1834); 'The Cotter's Saturday Night'; and 'Baptism of Ben Jonson's Daughter' (1837); 'The Pedlar' (S. Kensington Museum); 'Signing of the Covenant in Greyfriars' Churchyard' (1847); 'Minister and his Wife Concealing the Scottish Regalia in the Church' (1846).

Chisholm, Hugh (1866-1924), editor of the tenth, eleventh, and twelfth eds. of the *Encyc. Brit.*, was b. in London, son of Henry Williams C., authority on public finance, and grandson of Henry C., private sec. to Lord Grenville, the Prime Minister. He was educated at Felsted, and at Corpus Christi, Oxford; and, intending to practise at the Bar, he was called at the Middle Temple in 1892; but was already in journalism—as assistant editor of the *St. James's Gazette*,

of which he became editor in 1897. In 1900 he was engaged by the proprietors of *The Times* as joint editor, with Sir Donald Mackenzie Wallace and President Hadley of Yale, of the supplementary vols. of the *Encyc. Brit.*, constituting the tenth ed. In 1903 he became editor-in-chief of the eleventh ed.; he travelled all over the world in the performance of his duties. From 1911 till March 1920 he was financial editor of *The Times*, resigning to edit the additional post-war vols. of the *Encyclopaedia*.

Chisinau, see KISHINEV.

Chislehurst, forms, with Sidecup, an urban dist. of Kent, England, 11½ m. S.E. of London by rail. It is delightfully situated on a common. At Camden Place, in the vicinity, Napoleon III. d. in 1873, and the Empress Eugénie lived here for some years with the prince imperial, to whose memory a cross has been erected on the common. There is a chain of interesting subterranean caves whose origin and use have not been fixed with certainty, but they are believed to be ant. storehouses and hiding-places. Pop. 10,000.

Chistopol, dist. and tn. of the Tatar Republic of the R.S.F.S.R., Russia. Port on R. Kama, 70 m. from Kazan. Has considerable corn trade. Pop. 20,000.

Chiswick, par. and tn. of Middlesex, England (London suburb), Baling div. 7 m. from St. Paul's, on l. b. of R. Thames. The name was apparently formerly *Cesewic*, meaning 'cheese farm.' 'C. and Grove Park' is on the S. Region railway; 'C. Park and Acton Green' on Dist. railway. The duke of Devonshire's villa, C. House, is here; also gardens of the Horticultural Society, and many large market gardens. It contains Hogarth's house, and his grave in the churchyard. Pop. 41,000. Eccles. par. (with Turnham Green) about 5000 (with Brentford) 63,000.

Chita: 1. Tn. of Boyacá, Colombia, 74 m. from Tunja, 150 from Bogotá. On W. of snow-covered sierras, with important mine of rock-salt, 'salina,' on the other side. The saline springs are also noted. Pop. 10,000. 2. Tn. and region of the U.S.S.R., E. Siberia, on the R. Chita, near its junction with R. Ingoda. It was founded in 1851, and is on the Trans-Siberian railway, 370 m. from Irkutsk. C. is on the routes from Barguzin and the Mongolian frontier (Klakhta). It is an engineering, iron and steel, and machine-tool centre. About 65 per cent of the Soviet production of tin is believed to be in the C. region. The resources of the coal mines at C. (and Sretinsk) are supplemented by coal transported by rail from the Kuznetsk basin of W. Siberia. The pop. of the C. region in 1939 was 1,160,000. C. itself is a tn. of more than 100,000 inhab.

Chita (animal), see CHESTRIL.

Chitaldrug, or **Chitaldroog**: 1. Dist. of Mysore, India, very unhealthy, hence the least populous in Mysore. Area 4470 sq. m. In 1876-78 it suffered greatly from famine. Pop. about 574,000. 2.

Cap. of above, tn. and fortress of Nagar, 73 m. from Bellary, 128 m. from Seringapatam, at the base of a cluster of hills. Noted for a wonderful rock-fortress. Cannonments are abandoned because unhealthy. Manufs. cotton cloth and coarse blankets. Anct. name Sitala Durga (spotted castle). Pop. 9000.

Chitambo, vil. of N. Rhodesia, situated about 10 m. to the S.E. of the S. shore of Lake Bangweulu. It is noted as the place where Livingstone died in May 1873.

Chitin, skeletal substance found in all arthropods, forming most of their hard parts, and also in some other animals, e.g. the brachiopod *Lingula anatina*. It is a white, amorphous substance containing nitrogen, yields glucosamide in acids, and is insoluble in alkalis.

Chitonidæ, family of molluscs usually classed among the Gastropoda, consists of marine animals ranging in size from half an inch to half a foot; some are littoral and others have been dredged from a depth of 2300 fathoms. All the species are bilaterally symmetrical, have eight shell-plates embedded partially or entirely in the mantle, are covered with spicules, have an anterior mouth and a median posterior anus. They live on vegetable matter, and in habit are like limpets; they usually attach themselves to rocks, but can crawl by means of their long foot, and are capable of rolling themselves up.

Chitral, name of a native state in the N.W. Frontier Prov., Pakistan, and of its cap. The state has an area of about 1500 sq. m., and a pop. of 60,000. In 1885 the Lockhart mission visited C., and in 1889, and again in 1891, the British Gov. agreed to pay the reigning *mehtar* a subsidy on condition that he accepted its advice as to the foreign policy and defence. From 1895 to 1917 Great Britain exercised a protectorship over the state, and maintained a small force there, as it was an important Brit. outpost. The region is fertile and the climate cold; the chief crops are wheat, barley, maize, and rice. C. tn. is actually a group of vils. with a pop. of about 2500.

Chittagong, maritime dist. in Lower Bengal, India, bounded on the E. by Tipperah, on the S. by Arakan, and on the W. by the bay of Bengal. The country is very hilly, with many deep ravines. The hills are densely covered with creeper jungles and with thick forests of trees. There is elephant hunting in the forests. C. comprises an area of 6812 sq. m., and is divided into four valleys by the Rs. Pheni, Karnaphuli, Sangu, and Matamuri. Many different kinds of tribes inhabit the hills, but the religion observed is chiefly Buddhism. C. was ceded to the E. India Company in 1760. The port of C. is situated some miles distant from the mouth of the Karnaphuli, and exports rice, tea, and jute. C. was a valuable base of operations in 1943-44 against the threatened invasion of India through Burma by the Jap. armies of Gen. Mutaguchi. Pop. 40,000.

Chittagong Wood, product of *Chukrasia*

tubularis, an Indian species of Meliaceæ, also known as red wood, bastard cedar, and white cedar. It is largely used in cabinet making.

Chittambaram, see CHUDAMBARAM.

Chittoor, tn. of Madras Presidency, India, cap. of dist., of same name. Pop. 17,941; dist. 1,209,117.

Chittore, tn. of Rajputana, India, situated in the native state of Udaipur; Chittorgarh is the fort. Ruined palaces and temples are in the neighbourhood. Pop. 7000.

Chitty, Joseph (1776-1841), eminent special pleader and writer of *Treatise on Pleading* (1809), and *The Laws of Commerce and Manufactures and the Controls relating thereto* (1820), and other books on law. His three sons, Thomas, Joseph the younger, and Tompson, were also well-known lawyers and writers.

Chitty, Sir Joseph William (1829-99), son of Thomas C., was for sixteen years a very popular judge. He became master of the rolls in 1881, and was promoted to the court of appeal in 1897; he wrote legal text-books.

Chiusa, or La Chiusa (Lat. *clausa*, shut in): 1. Com. and tn. of Piedmont, Italy, 8 m. from Cuneo, on the Ellero. Also a delle of N. Italy. Pop. 5240. 2. Com. of Sicily (Chiusa Sciafani), 30 m. from Palermo. Pop. 5800.

Chiusi, in Italy, important tn. in the prov. of Siena, Tuscany. It is the anct. Clusium, one of the twelve cities of the Etruscan Confederation. C. is celebrated chiefly in connection with the discovery of Etruscan antiquities; vestiges of fortresses are to be seen, as well as grottoes or catacombs, which served as tombs and where were found the sun-dried black earthenware vases, ornaments, etc., now in the museums of Florence and C. Danto describes the 'pestilential pool' the tn. was in the Middle Ages, but draining in the eighteenth century restored it to wholesomeness. In the campaign of 1943 slight damage was sustained by the cathedral, but the Museo Etrusco was severely damaged, none of the contents having been evacuated, and cases containing the finest Etr. and Etruscan clay and metal vases were smashed. Pop. 8000.

Chivalry, or the system of knighthood, is closely bound up with the feudal system of Norman times. It has its roots, however, right back in Germanic times, as Tacitus shows in his account of the manners and customs of this race. But C. became further developed in the eleventh century, and the order of knighthood involved many duties and responsibilities. The king himself had to train for knighthood when he had to serve first as page, then as esquire, before being presented with the golden spurs which were one of the symbols of knighthood. Before a knight was admitted into his order, a vigil or night-watch was held by him in some gloomy chapel aisle where he gave himself up to solemn meditation before assuming his new duties and privileges. C. was eminently social in its relations to feudalism, and

assumed a deep spiritual significance in its relations to the crusade movement where the knight had to perform military service for the cause of Christianity against the infidel in Palestine. The favourite sport of C. was the tournament or joust, in which the knight sought to win his lady's favour. A tournament would occupy some two or three days. There would be a trial of combat between two knights, often with lances, and the victor, besides winning the armour and horses of the vanquished, would be permitted to name some lady who would preside over the remaining sports, and who was called the Queen of Love and Beauty. The idea of a love both spiritual and chivalrous became associated with the word C. in the Middle Ages. Here the love of a lady implied a deep and reverent attachment to the whole of womanhood; at the same time one woman could be the particular object of the knight's thoughts, when the relationship was purely platonic. C. under these conditions gave rise to a vast library of literature, in which all kinds of romances, adventures, and poems were written. See also KNIGHTHOOD.

Chivalry, Court of, military court estab. under Edward III., regulated by Richard II., 1390, of which the earl marshal and lord high constable were joint judges. Replaced now by the common law courts and courts-martial, it sat for the last time in 1737. Now represented only by the earl marshal of the Heralds' College to decide questions relating to armorial bearings. See Sir W. Blackstone, *Commentaries on the Laws of England*, 1765-68; H. J. Stephen, *Commentaries on the Laws of England*, ed. of 1883.

Chivasso, com., tn., and episcopal see of Piedmont, Italy, on R. Po, 15 m. from Turin. Fortress of the counts of Montferrat till destroyed by the Fr., 1804. Remains of their palace are left. There is a fine cathedral, and the sulphur baths of San Gesezio are near. Noted for lampreys and silk industries; has markets for grain and cattle. Pop. 11,000.

Chive, *Cive*, or *Allium Schenoprasum*, a liliaceous plant related to such well-known plants in culinary use as the leek, onion, and garlic. Like them, it grows in Britain, and the leaves are considered to be edible, their chief use being to flavour soups and stews. The Cs. grow from bulbs, the leaves are long and narrow, and the flowers are bright purple or pinky in colour.

Chivilcoy, tn. of the Argentine Republic, situated 110 m. W. of Buenos Aires, with which it has railway communication. There are manufs. of brandy and iron goods. Pop. 45,000.

Chizerots, or **Burins**, name given in France to the debris of one of those despoiled races known under the general name of *Cagots*. The C. are found in sev. of the coms. of Bourg. in the dept. of Ain. They were mostly field-labourers, butchers, and cattle-dealers, living laborious lives apart from the rest of the community. Opinion is divided as to their origin, but they are supposed to be of mixed Goth and Saracen blood. In the

Middle Ages they were the object of all kinds of persecution and restrictions. During the eighteenth century sev. attempts were made to rehabilitate them, but only with the revolution were they allowed ordinary civil rights. See F. Michel, *Histoire des races maudites de la France et de l'Espagne*, 1947.

Chkalov (formerly Orenburg), frontier region of the R.S.F.S.R., between Bashkirla on the N. and Kazakhstan on the S. Area, 22,000 sq. m. Pop. (1935) 680,000. It comprises, chiefly, the former Orenburg and Orsk dists. of the considerably larger prov. of the same name as constituted before the First World War. It is elevated, except for the valleys of the Ural and other rvs. Topographically it is part of the dry and desert region of the steppe, but there is fertile land in the valleys. Rock salt and coal are mined in the vicinity of Ilets, in the S. There are oil refineries at Orsk. C. is the chief tn. on the Ural R. and lies on the Moscow-Tashkent railway. Its chief industries are metal goods, saw-milling, bricks, and brewing, and it is a market for the cattle and horses of the steppes. Produces frozen meat, hides, and tallow. Pop. 125,000 (includes Russians, Khirghiz, Tatars, and Bashkirs).

Chladni, Ernst Florens Friedrich (1756-1827), Ger. philosopher, founder of the science of acoustics. He was b. at Wittenberg, became doctor of laws and prof. of jurisprudence at Leipzig, but after some time abandoned law and gave himself up to the study of natural science, investigating chiefly the laws of sound. During the years 1802-12 he travelled and lectured with great success in Germany, Holland, Italy, Russia, and Denmark. Among his writings are treatises on acoustics and meteors. See his life by Meide, 1866.

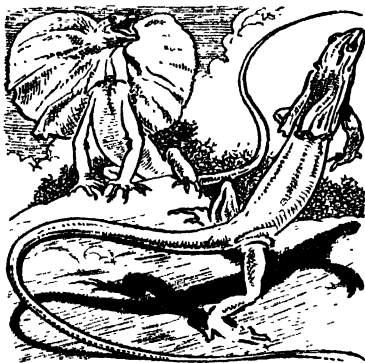
Chlamaceae, small natural order of dicotyledonous plants, consists of about two dozen handsome trees or shrubs of no known use. They all grow wild in Madagascar, and the order is closely allied to Theaceae.

Chlœnius, genus of Carabidae, belongs to the Coleoptera. There are many species dwelling in Europe, Africa, Asia, and N. America; *C. sericeus* and *C. tomentosus*, two medium-sized purple or greeny-bronze beetles, are found in the U.S.A.

Chlamydomorphus, or **Pichyelego**, edentate quadruped of the armadillo family, or Dasypodidae. The species, of which only two are in existence, are small animals covered over with four-sided, horny plates which are thin in the front and strong in the hinder region. The external ears are very small, and the small eyes are buried in long silky hair; under the bony plates and over the whole body the straw-coloured hair also prevails. The limbs are short and there are five digits on the fore limbs. *C. truncatus*, a native of Mendoza, Argentina, is the more common species; it is about five inches in length, has strong burrowing habits, and is insectivorous in diet.

Chlamydosaurus Kingi, or **Friedl lizard** of Australia, represents a genus of the

family Agamidae. It is noted for the expanse of skin, in the shape of two large disks, which forms an ample frill to the sides of the neck and throat, and can be unfolded when the lizard is angry and folded again at will. In length it is about 3 ft., and when running it presents a curious spectacle, for it accomplishes the feat with its fore limbs in the air. The creature is allied to the iguana and in habit is arboreal. The general colour is yellowish-brown variegated with black.



(CHAMYDOSAURUS KINGI: FRILLED LIZARD)

Chloasma, deposit of pigment in the skin, forming yellowish-brown patches, due to irritation, the use of skin drugs, or certain specific diseases, or abnormal conditions. Liver-spots follow dyspepsia, and are usually associated with liver disturbances. Patches appear on the forehead, cheeks, nipples, and the middle of the abdomen in connection with certain conditions of the uterus; they are more marked during pregnancy and sometimes during menstruation. Tuberculous patients sometimes exhibit brown patches on the forehead and cheeks. The causal connections are somewhat obscure, and in most cases nothing can be done to mitigate the conditions except treatment of the predisposing disease.

Chlodowech, or **Chlodwig**, see CLOVIS.

Chlopicki (pron. *Chlopitzki*), **Gregorz Jozef** (1772-1854), Polish general and patriot. He took part in the first Polish insurrection, then served under Napoleon in the Grande Armée. After the taking of Paris in 1814 he led back to Poland the remnant of the Polish troops and was made general of div. by the Emperor Alexander. After the second Polish insurrection (1830) C. became, though most unwillingly, dictator. He soon resigned in order to re-enter the army and fight as a simple soldier. He was wounded at Grochow.

Chlora, genus of Gentianaceae, contains only three species, and of these *C.*, or *Blackstonia perfoliata*, the yellow-wort, is a native of Britain. It grows wild on chalky hills and banks of England and Ireland, but does not occur in Scotland. It possesses

a bitter principle which renders its action on the system tonic. The other two species are to be found in various parts of Europe and in N. Africa.

Chloral (trichloroacetaldehyde, CCl_3CHO), formed by the action of chlorine on anhydrous alcohol. It is an oily, colourless liquid with a penetrating odour. Combined with water it forms *C. hydrate* (q.v.), while with alkalis it forms chloroform and a formate. It was discovered in 1831 by Liebig. It is used as a drug to produce sleep, when from 15 to 30 grains are sufficient. It is also used to alleviate pain, and to check excitement and convulsions, etc. Since it tends to reduce the heart's action and lower the temp. of the body its use is dangerous.

Chloral Hydrate, commonly but erroneously called chloral, is chloral combined with water, and is a white crystalline substance with a pungent smell and a bitter taste. *C. H.* treated with caustic potash gives pure chloroform. It has anæsthetic properties, and is a drug.

Chloranthaceae, small natural order of tropical or sub-tropical dicotyledonous plants, consists of herbs, shrubs, and trees allied to the peppers, and having an aromatic fragrant odour. The hermaphrodite or unisexual flowers are small, with a rudimentary or sepaloïd perianth, one to three united stamens, an inferior ovary consisting of a single carpel, and a few seeds with oily endosperm and no perisperm.

Chlorargyrite, see CERARGYRITE.

Chlorate, see CHLORIC ACID.

Chloric Acid (HClO_3) is obtained by decomposing barium chlorate with its exact equivalent of dilute sulphuric acid. It is a clear, unstable liquid, and the strongest acid contains 80 per cent of water. It has powerful oxidising properties, and if wood or paper be dropped in it, the oxidation is so rapid that they will char, and even take fire. It further has strong bleaching powers. It is a monobasic acid, and forms stable salts called *chlorates*. The most important of these is *potassium chlorate* (KClO_3). The chlorates are usually formed indirectly by passing chlorine into a hot solution of the hydroxide of the metal, and then crystallising out the chlorate. Chlorides are formed at the same time, but they are much more soluble and remain in solution. Potassium chlorate is manufactured by the electrolysis of a hot concentrated solution of potassium chloride. Since chlorates contain a large amount of oxygen, they are used as oxidising agents, potassium chlorate being used in the manuf. of matches, and in pyrotechny, especially where coloured effects are required; it is also used in tabloid form for the alleviation and cure of sore throat. Sodium chlorate is a very efficient and widely used weed killer.

Chloride, Ethyl, see ETHYL CHLORIDE.

Chloride of Lime, see BLEACHING POWDER, BLEACHING.

Chlorimetry, term applied to the estimation of the proportion of available chlorine in bleaching powder (q.v.). It varies from 20 to 43 per cent. The

process is one of volumetric analysis. It is usual to make a definite solution of arsenious acid or some other substance which can be oxidised. The solution of bleaching powder is then carefully run into a measured quantity of the arsenious acid, and by the aid of an indicator—a paper moistened with potassium iodide and starch—sufficient is added until oxidation is quite complete. The quantities of both liquids being known, the available chlorine can easily be found by calculation from the formula: $\text{H}_3\text{AsO}_3 + \text{CaOCl}_2 = \text{H}_3\text{AsO}_4 + \text{CaCl}_2$.

Chlorine (symbol Cl; atomic weight 35.4; atomic number 17) was discovered by Scheele in 1774. He called it *dephlogisticated muriatic acid air*, and regarded it as a compound. In 1810 Davy proved it to be an element, and gave it its present name, because of its greenish-yellow colour. It does not occur free in nature, but it is very common in combination with metals, the commonest chloride being sodium chloride (common salt). As such it occurs in all natural waters; in beds as rock salt, in animal secretions, and in plants. In combination with hydrogen, as hydrochloric acid, it is found in volcanic gases and in the gastric juice. Cl. can be obtained in various ways: (1) by heating gently manganese dioxide and hydrochloric acid, water, manganese chloride, and Cl. being formed; (2) by heating manganese dioxide with a mixture of the substances from which hydrochloric acid is made, e.g. common salt and sulphuric acid. This results in the formation of sodium sulphate, magnesium sulphate, water, and Cl. A comparison of these two methods shows that whereas the second process results in the obtaining of all the Cl. from the common salt, the first process leaves half of it in the form of manganese chloride; (3) many highly oxidised compounds, together with hydrochloric acid, give us Cl., and among these substances may be named potassium dichromate and potassium chlorate.

Manufacturing Processes: 1. *Weldon's process* is really a process by which the manganese chloride mentioned above can be turned again into manganese dioxide, and re-used to act upon further supplies of hydrochloric acid, giving further quantities of Cl. 2. *Deacon's process* depends upon catalysis (q.v.); air, or oxygen and hydrochloric acid, are passed over pumice impregnated with cuprous chloride (a salt of copper), which has been heated to a dull-red heat. Then water is formed and Cl. evolved. But Weldon's process is now obsolete, and Deacon's is rarely used. Most of the chlorine now manufactured is obtained by the electrolysis of a solution of common salt.

Properties.—It is a greenish-yellow gas, which has a suffocating smell. If inhaled in the pure state it would cause death. It acts very rapidly on the mucous membranes even when largely diluted in the air. Very dilute in the air, however, it imparts a pleasant odour to a room. It is twenty-four times as heavy as air, but when heated its density is considerably less than it should be. So while at lower

temps. its molecular formula is Cl_2 , i.e. has two atoms in the molecule, at higher temps. it must dissociate into single atoms. It is fairly soluble in water, although it may be collected over warm water, or over brine. It has such powerful chemical affinities that it will enter into combination with a large number of elements at the ordinary temp.: in many cases so violent is the combination that the other body takes fire, e.g. phosphorus, arsenic, antimony. It is remarkable to notice that if the Cl. be dry it will not unite with these substances. It has a strong affinity for hydrogen. If the two gases be mixed and heated, or even exposed to sunlight, they will unite with an explosion to form hydrochloric acid gas. Cl. possesses strong bleaching powers by virtue of this great affinity for hydrogen, for it will unite with the hydrogen in water, displacing the oxygen, and this nascent oxygen acts on colouring matter, bleaching it. It is this bleaching power which makes it valuable commercially, and for this purpose it is combined with lime to form bleaching powder (q.v.). Cl. gas can be liquefied by lowering its temp. to -31°C ., when it has a golden colour. At -104° it freezes into a yellow crystalline mass. As a liquid it is packed in lead-lined iron bottles and exported to be used in the extraction of gold by the *chlorination process*. Liquid Cl. enters into combination with the gold in the ore and forms a soluble chloride which can be separated from the insoluble residues. Then by suitable means the gold can be obtained. Cl. is one of the *halogen* group of elements, which are fluorine, Cl., bromine, and iodine, all of which possess similar properties. See HYDROCHLORIC ACID, FLUORINE, BROMINE, IODINE.

Chlorine in Warfare. The introduction of Cl. as a weapon in modern warfare dates from April 22, 1915, when the Gers. discharged it from cylinders opposite a sector held by the Fr., while another attack was made on the Canadian front on April 24. The gas was a complete surprise to the unprotected troops, and it removed all resistance on the front affected to a considerable depth. Crude respirators were soon supplied to the troops, and later much improved upon. The first gas attack by the Brit. was made at Loos on Sept. 25, 1915, using cylinders of chlorine. It is noteworthy that conditions of wind were more frequently favourable to the Allies than to the Gers. The gas shell was eventually substituted for the cloud method, and found to possess many advantages. It is relatively independent of wind, and enables many more toxic substances to be used. Cl., phosgene, chloropicrin, and others were classed as asphyxiating gases, and produced their effect by causing lesions and congestion in the pulmonary system while death frequently resulted from suffocation. Cl. was not used in the Second World War.

Chlorite, mineral of a green colour and composed of silicate of alumina, iron, magnesia, and a certain amount of water. It is soft, and when crystallised in small green hexagonal crystals is scaly in

texture. It forms the prin. part of C. schist in the region of the metamorphic rocks and is also an alteration product of hornblende and other minerals in many crystalline rocks. There are many varieties, and for convenience these may be divided into orthochlorites, which are crystalline, and leptochlorites, which are not.

Chlorite Schist, variety of schist chloritic material such as clinocllore, together with quartz, mica, talc, feldspar, and other bodies.

Chloritic Marl, name given to what is really glauconite marl. It is a chalky marl of a white or yellow colour and situated at the base of the chalk. The name 'chloritic' was given owing to the presence of grains of glauconite scattered through it, which was wrongly supposed to be chlorite. It also contains phosphatic nodules. The C. M., together with the two beds above it, namely, the chalk marl and the grey chalk, form the div. called the Lower Chalk of the Upper Cretaceous Period. The prin. fossils are varieties of *Ammonites* or *Schlenbachia*. Beds vary in depth up to 15 ft.

Chlorocinnose ($C_7H_5ClO_2$), compound produced by the action of chlorine upon oil of cinnamon. When pure it exists as brilliant crystals, which are colourless. It volatilises by heat without change.

Chloroacetic Acid, or **Cyanuric Chloride** (CCl_3N), is obtained when anhydrous hydrocyanic acid and chlorine are together exposed to the action of sunlight. It is a crystalline, forming needles, and has a disagreeable smell. Heated with water it is decomposed, and gives cyanuric acid and hydrochloric acids.

Chlorodyne, popular patent medicine, first compounded by Dr. Collis Browne. Owing to its dangerous nature and variability of composition, the latter was fixed by the Brit. pharmacopœia of 1885 as chloroform, morphine, prussic acid, ether, and, in addition, peppermint and a syrup. It is useful for diarrhœa and coughs, but must be used carefully.

Chloroform, or **Trichloromethane** ($CHCl_3$), volatile liquid widely used as an anæsthetic. It has a pleasant odour, boils at 61° , has a melting point of 62° , and a sp. gr. of 1.5 at 15° . It is not inflammable at ordinary temps., but burns with a green-edged flame when heated. It is formed when methane, methyl chloride, or methylene dichloride is treated with chlorine in sunlight, but is commonly prepared by distilling alcohol or acetone with bleaching powder, or by warming chloral or chloral hydrate with a solution of sodium hydroxide. C. quickly decomposes in air, especially in the presence of sunlight, carbonyl chloride and hydrochloric acid being produced. As carbonyl chloride is a dangerous impurity when the C. is used for anæsthetic purposes, it is customary to keep the liquid in the dark, and the addition of a small percentage of alcohol serves to effect the decomposition of any carbonyl chloride which may be formed. A good test of the purity of C. is provided by the addition of silver nitrate when no

precipitate should form; it also should not darken when agitated with strong sulphuric acid. C. was introduced as an anæsthetic by Sir James Simpson in 1847, and it quickly superseded ether for long operations. It is administered by means of a loose-fitting mask which allows mixture of air, and the strength of the vapour is gradually increased. The effect of the inhalation is to produce first a state of disordered consciousness, which leads to complete unconsciousness. The reflexes persist for some time, and there are energetic movements of the muscles. In the next stage the muscles relax, and many of the reflexes disappear, though the vital centres in the medulla are still sensitive, and the heart muscle is active; this is the stage suitable for surgical operation. Later, the vital centres in the medulla may become paralysed, in which case respiration stops and life is endangered. C. under skilled management is a safe anæsthetic, the mortality being about 1 in 2500, and the after-effects in favourable cases rarely include painful vomiting. C. is also administered internally as a stimulant, anodyne, and as an antidote to strychnine poisoning. Externally, it is used to dilate the superficial blood-vessels, and as a local anæsthetic in cases of toothache.

Chloro-nitrous Gas, or **Nitrosyl Chloride** ($NOCl$), orange-coloured gas obtained by the direct union of chlorine and nitric oxide. It is easily liquefied at about 5° C. and atmospheric pressure, and is readily decomposed in the presence of water and hydroxides of sodium, potassium, or ammonium.

Chloropal, massive mineral resembling opal. It is green in colour, and consists of a hydrous silicate of iron.

Chlorophyll, green colouring matter of plants, in which it is accompanied by two other substances, carotin ($C_{40}H_{56}$) and xanthophyle ($C_{40}H_{54}O_2$). C. is not a single compound, but, as was shown by Willstätter, a mixture of the bluish-green chlorophyll-a with about one-third of its weight of the yellowish-green chlorophyll-b. Chlorophyll-a has the formula $C_{55}H_{90}ON_4Mg$ ($COOCH_3$) ($COOC_2H_5$), and chlorophyll-b a similar constitution except that it contains one atom of oxygen more and two atoms of hydrogen less. C. is insoluble in water, but dissolves in alcohol, benzene, and chloroform, and when extracted by the aid of one of these solvents, appears as a green amorphous mass. It is dichromatic, that is to say, when a thin layer is viewed by transmitted light, it appears green; but when the layer is of considerable thickness, it is dark red in colour. This is explained by the fact that whereas both red and green rays are transmitted, the green rays predominate in a thin layer, but are absorbed with greater facility than the red if the layer be thick. The development of C. in plants appears to depend on certain conditions of temp. and light, for if parts of a plant are hidden from sunlight, they quickly become blanched. The function of C. is to aid in the nourishment of the plant by absorbing carbon dioxide from

the atmosphere and producing carbohydrates. The nature of the process (photosynthesis) is obscure, but sunlight is an important factor, and the C. cells appear to possess the power of absorbing radiant energy from the sun's rays, by means of which the necessary chemical changes are brought about. Viewed microscopically, the C. of plants is seen to consist of granules or corpuscles called chloroplasts, which are embedded in the protoplasmic substance of certain cells. The chloroplasts of the algae frequently exhibit a complicated appearance; in *Spirogyra*, for instance, they are spiral in shape. It is associated with other pigments in the plant economy, and the changing colours of spring and autumn are probably due to changes in the relative amounts of C. and other pigments (anthocyanins, and also the xanthophyll constituent of the C. itself). The existence of C. is sometimes taken as the distinguishing characteristic of the plant as compared with the animal, but some plants seem to build up their tissues without the aid of C., and some animals, such as certain Infusoria, hydra, etc., possess C., but this is due to symbiotic algae. Molluscs and crustacea frequently exhibit C. as the result of absorption from food.

Chlorophyllite, mineral consisting of quartz, chlorite, and muscovite, occurring usually in scales or laminae. It is a variety of the larger group of the phyllites, minerals intermediate in character between the clay-slates and the mica-schists.

Chlorosis, or **Green Sickness**, form of anemia peculiar to the female sex, and particularly associated with the period of the attainment of puberty. The patient has a peculiar greenish pallor, is afflicted with palpitations, faintness, and gastric disturbances, and suffers from general languor and debility. The cause is a diminution of the proportion of hæmoglobin, or red colouring matter of the blood, due to the system badly accommodating itself to the new activities of the genital organs. It is therefore found chiefly amongst girls of sedentary occupation, pursuing exhausting work under bad hygienic conditions in ill-ventilated offices and factories, without a due proportion of leisure and healthy exercise, and often without suitable nourishment in the way of wholesome food regularly taken. The supply of hæmoglobin is furnished by the bone-marrow, and under normal healthy conditions the red corpuscles increase in number to replenish waste caused by any undue strain upon the system. The frequency of amenorrhœa in cases of chlorosis indicates that the organism resists any further drain of red corpuscles, and the other painful symptoms, such as faintness and dizziness, indicate that the blood is too poor in hæmoglobin to carry out its nutritive functions in an efficient manner. The treatment should include rest, abundance of suitable food, and general observance of hygienic principles. If possible a complete change of surroundings

and occupations should be effected. Iron preparations should be assiduously administered and continued for a long period if necessary. The condition is not dangerous in itself, and ceases when the patient has progressed further into womanhood, but the long-continued debility may diminish the resisting power to other diseases, such as tuberculosis. Great care must be taken to avoid relapses which are very apt to occur. It is doubtful whether there is any hereditary tendency towards the disease, which is much less common at present than formerly.

Chlorovaleric Acid, chlorine substitution product of valeric acid. When the anhydrous valeric acid is mixed with red phosphorus and dry chlorine passed into the mixture in the presence of sunlight, an atom of chlorine is substituted for an atom of hydrogen.

Chlumetz, tn. of Czechoslovakia, situated on the R. Cidlina, 46 m. N.E. by E. of Prague. Pop. 4000.

Chmielnik (or **Khmielnik**), tn. of W. Ukraine, Russia, on the R. Bug, 93 m. N.W. of Kamenets-Podolsk. Pop. 11,000. 2. Tn. of Poland, in the prov. of Kielce, 18 m. from Kielce. Woollen-cloth manufs. dyeworks. Battle against Tatars, 1241. Pop. 9000.

Choanites, or **Petrified Anemone**, name of a fossilised zoophyte found in the chalk. The popular name is given to it on account of its radiating appearance.

Choate, Joseph Hodges (1832-1917), Amer. lawyer and diplomat, b. at Salem, Massachusetts. His father, George C., was a doctor of some reputation and brother of Rufus C., a lawyer, congressman, and senator; he was educated at Harvard, 1852-54; admitted to the New York Bar, 1856. He practised with brilliant success, being specially noted for his powers of cross-examination. In 1871 he became a member of the Committee of Seventy which broke up the corrupt Tweed Ring that ruled New York municipal politics. In 1891 he was president of the New York State Constitution convention, and in 1899 he was appointed by President McKinley as ambas. to Great Britain. He was very popular and assisted greatly in the growth of a good feeling between the two countries; he was succeeded in 1903 by Mr. Whitelaw Reid. In 1907 he was the representative of the U.S.A. at the second peace conference at The Hague. He was anxious for the early entry of America into the First World War, and his exertions in this regard hastened his death, at New York.

Choba, trib. of the R. Zambesi, S. Africa. It was discovered by David Livingstone, 1851.

Cho-Bo, tn. Tong-king, Fr. Indo-China, situated on the Song Ho (Black R.) at the point where the riv. bends N. before it enters the Song Koi (Red R.). It is an important trading centre, and gold is worked in the neighbourhood.

Chocolate, see COCOA AND CHOCOLATE. **Choctaws**, **Chahtas**, or **Chacatos**, tribe of N. Amer. Indians of the Muskogean family, now largely intermarried with white and negro stock. They are

citizens of the U.S.A., numbering about 18,000. Their original hunting grounds were the S. part of the Mississippi valley, but they are now settled in Oklahoma. They sided with the Confederates in the Civil war, and suffered the loss of all their rights. Their slaves were set free. They are included among the more highly civilised tribes of N. America. Their custom of compressing the heads of male infants earned the name of 'flatheads' for them. The C., like all the Muskogean stock, were among the most warlike and fierce of all the Amer. Indians.

Chodkiewicz, Jan Karol (1560-1621), Polish soldier, and most famous member of a famous family. Served under Alva in the Low Countries and, later, under Zamoyski in the Turco-Moldavian campaign, where he obtained high command. Played a prominent part in resisting repeated Swedish invasions of the Baltic provs. Made a hetman of Lithuania in 1605 and won a remarkable victory with 4000 men against a Swedish army of nearly 20,000. In 1619, however, he was forced to sue for peace, his position having been undermined by revolts. Subsequently, when the Turks and Moldavians attacked Poland and defeated Zolkiewski, C. counter-attacked and completely defeated the invaders, but died soon afterwards.

Chodowiecki, Daniel Nicolas (1726-1801), Polish painter and engraver, b. at Danzig. He produced the famous set of miniatures, 'The History of the Life of Christ,' but of the 3000 works catalogued in his name only a few are worthy of mention, such as 'Jean Calas and his Family,' 'Hunt the Slipper,' and sev. engravings illustrating incidents in the Seven Years war. He has occasionally been known as the Ger. Hogarth, possibly because of his truthful representation of actual life and the skilful arrangement of his drawings. He became the director of the Berlin Academy in 1797.

Chodzko, Alexander (1804-91), Polish poet and oriental and Slavic scholar. He was appointed Russian consul to Persia, 1829, and made a special study of the language and literature of that country and also of other oriental languages. In 1842 he went to Paris, and in 1858 succeeded Mickiewicz as prof. of Slavonic literature at the Collège de France. He was the translator of many Persian poems, among others fifty-two lamentations or miracle-plays concerned with the deaths of Hassan and Husein. He pub. *Popular Poetry of Persia* (1842), *Fairy Tales of the Slav Peasants and Herdsmen*, trans. into Eng. (1895), a Persian grammar, and many other works.

Chorilus: 1. Athenian tragic poet, competed with Æschylus 499 B.C. Said to have written more than a hundred plays, but none is extant. 2. Poet of Samos (fl. c. 480 B.C.). Fragments of an epic *The Persæid*, written at the court of Archelaus of Macedonia, have been preserved.

Choropotamus, fossil genus of artiodactylous mammals, belongs to the family

Suidæ, and is a near ally of the wild boars. This genus of hogs was estab. by Cuvier, and the species have been found in the Upper Eocene.

Choropus castanotis, the pig-footed bandicoot, an Australian marsupial of the family Peramelidæ. It is an omnivorous, burrowing animal with long ears and tail, and the two well-developed digits on its fore limbs give them a pig-like appearance.

Choga, or Kloga, one of the chain of lakes in Uganda, E. Africa, forming a kind of extensive backwater in the headwaters of the Nile. It is marshy and shallow, 20 ft. being its average depth; length 85 m.; breadth 13 m. It receives two rivs., Mpologoma and Seziwa, in addition to the White Nile which flows through it.

Choir, formerly spelled *quire*, as it is pronounced (from O.F. *cur*, modern *chorus*; Lat. *chorus*), the name of the trained or organised body of singers who take part and lead in the musical portions of a church service, or perform portions of the service alone, where the congregation do not join, as in the singing of anthems. The term is also applied to a body of male and female singers who perform the choral portions of a musical composition; and to the part of the church used by them. In the Anglican Church, the C. usually consists of male voices only, boys taking the treble or soprano parts, and boys or one or two rare male voices, the alto or contralto parts, and men the tenor and bass. They usually are surpliced. In cathedrals they are divided into two portions, *cantoris*, i. e. on the precentor's or N. side of the chancel, and *decani*, on the dean's or S. side. The men form a special body attached to the cathedral and are termed vicars-choral or lay clerks.

Choiseul, César, Duc de, Sieur du Plessis-Praslin (1598-1675), Fr. general who distinguished himself at the siege of La Rochelle, 1628, and in Piedmont, 1636-1643; at the end of which campaign he was made a marshal. Gained a decisive victory over the Spaniards at Trancheron in 1648, and, soon afterwards, having been given the command of the royal forces in the war of the Fronde, he defeated Turenne at Rethel, 1650. Created duke in 1665, also known as the Marshal du Plessis.

Choiseul, Etienne François, Duc de (1719-85), Fr. statesman, eldest son of François Joseph de C. marquis de Stainville (1700-70), b. in Lorraine on June 28. He entered the army and fought in the war of the Austrian Succession. He became lieutenant-general after seeing service in Italy and Bohemia, and in 1750 he married Louise Honorine, the wealthy daughter of Louis François Crozat, marquis du Châtel. In 1753 he was ambas. to Rome and in 1757 was transferred to Vienna through the assistance of Mmo de Pompadour. His skill and energy brought him to the position of minister for foreign affairs in 1758, and he controlled the French foreign policy through the Seven Years war. He became minister of war and marine, and

again minister of foreign affairs in 1766. Having failed in his Austrian policy he strove to retrieve the situation by an alliance with Spain, known as the Family Compact, but it was too late to save Canada or the Fr. possessions in India, from Great Britain, and he turned his energies to fresh colonies in the Antilles and San Domingo. In 1768 he annexed Corsica with the hope of its future use in the colonisation of Africa. His ruin was caused by his assisting M^{me} de Pompadour to expel the Jesuits from France, for at her death the Chancellor Maupeou, aided by M^{me} du Barry, persuaded Louis XV. to dismiss him, and he then retired to Chanteloup. In 1774, Louis XVI. recalled him, but did not restore him to favour. C. was a man of great ability, but without perseverance. He has been accused of exciting the war between Russia and Turkey (1768) from motives of revenge. He died in Paris on May 8, leaving huge debts, which his widow paid for him. See H. Walpole. *Memoirs of the Reign of George III.*, ed. by G. T. R. Barker, 1894, and F. Calinettes (ed.), *Mémoires du duc de Choiseul*, 1904.

Choisy-le-Roi, tn. of France, in dept. of Seine, situated on the l. b. of the Seine, 7 m. S. of Paris. Its manufs. are soap, chemicals, glass, morocco leather, earthenware and porcelain goods. In the cemetery is buried Rouget de l'Isle, the writer and composer of the *Marseillaise*. Pop. 27,500.

Choke-cherry, name given to sev. species of rosaceous plants in the genus *Prunus*, which are all natives of N. America and have astringent fruit. *P. virginiana*, the common C., is shrubby in habit and bears its small drupes in racemes.

Choke Damp, miners' term for carbon dioxide. Under ordinary circumstances it may be found in recesses or badly ventilated places in the mine, but is formed in huge quantity when an explosion of coal-gas mixed with air occurs, owing to the combination of the carbon of the gas and the oxygen of the air. When formed in this way it is known as *after-damp*. When the atmosphere is charged with a large amount of carbon dioxide, symptoms of suffocation occur through deficient oxidation of the blood.

Choking, suffocation by obstruction or compression of the windpipe. Any object indrawn into the windpipe when swallowing food is usually the cause of C.; such objects, fishbone, piece of bread, etc., become impacted in the glottis, at the top of the windpipe, blocking the passage. Children, also, often get buttons, small coins, etc., lodged in the same place. The natural response of nature is to cause a fit of violent coughing which removes the obstruction. Failing this, where cases threaten to prove fatal by asphyxiation, tracheotomy must be performed i.e. an incision is made into the trachea from the front of the neck, so that a tube can be inserted; the operation was formerly often necessary in the treatment of diphtheria. In cases of external compression of the windpipe, such as in strangling, hanging, or garrotting, the

heart and lungs are paralysed, breathing ceases, and death occurs in a few seconds. It should be noticed that in execution by hanging, C. does not occur, death being produced by dislocation of the neck vertebrae.

Chola, name of an anct. div. and dynasty of the Tamil country, India, between the Cauvery R. and the S. Pennar, Madras. The whole S. peninsula of India was once ruled by the C. dynasty. Its hist. began in A.D. 860, but gradually declined, and was extinguished in the eleventh century.

Cholecystitis, see under GALL-STONES.

Cholelithiasis, see GALL-STONES.

Cholera, name given to a number of diseases characterised by the discharge of a watery fluid from the bowel. Such a disease, under the name *χολέρα*, is alluded to by Hippocrates, Galen, and other anct. writers on medicine, who probably referred to what is now known as *cholera nostras* or summer C. The more malignant disease, Asiatic C., has its home in India, particularly in the lowlands of Bengal, and was confined to E. countries until the nineteenth century. In 1817 an epidemic of C. spread from India to Japan in one direction and in the other reached Astrakhan in 1823. Another epidemic started in India in 1826, reached Astrakhan in 1830, Moscow and Berlin in 1831, Paris and the Brit. Isles in 1832; it was carried by emigrants to Canada in the same year, and raged with varying virulence until 1838. The next great epidemic reached Europe in 1847 and lasted until 1855. In 1865 the disease again appeared in Europe, travelling from India to Mecca, whence it was disseminated by pilgrims to Egypt and other parts. In 1884 it reached Europe again by the same pilgrim route and was carried to S. America by an ft. ship. In 1892 a severe epidemic appeared in Paris and subsequently in Germany and Russia. In Hamburg there were 16,956 cases and 8665 deaths. By 1895 the disease had exhausted its energies in Europe, though it still prevailed in Arabia, Persia, China, and Japan as well as in India. The specific cause of Asiatic C. is a micro-organism which invades the intestines and develops there. R. Koch found in the stools of C. patients a microbe of the genus *Spirillum*, which he called the 'comma' bacillus (actually bacterial vibrios) from its shape, and asserted it was the cause of the disease. It is a very motile organism, possessing a single long flagellum, and appears only in the intestinal tract. Cultures of this microbe show it to be a somewhat weakly organism, unable to live at a temp. above 60° C. or in the presence of any acid, being at once killed by drying, and readily overgrown by other bacteria. When these facts were estab., scientists found it difficult to believe that the comma bacillus could be responsible for such widespread and obstinate outbreaks of disease, and many attempts were made to account for its virulent nature under certain conditions. The outcome of the investigations seems to credit the microbe with two or more

stages of development. Like many other parasites, when it emerges from the human body, it has to develop under certain other conditions of temp., moisture, and food, before it regains its virulence. This accounts for the fact that direct contact with a *C.* patient, or even the swallowing of ejected germs is not highly dangerous, though the exposure of the smallest quantity of the dejecta of a patient may subsequently lead to a serious extension of the epidemic. The disease may be both air- and water-borne. In Hamburg the drinking of unfiltered riv. water was undoubtedly the cause of the outbreak of 1892, as in Altona, where the water was filtered, the pop. escaped except for cases imported from Hamburg. The symptoms are usually classified in three stages. There is first of all a preliminary diarrhœa which may not occasion alarm; the characteristic *C.* attack follows, including vomiting and profuse liquid evacuations. These are very frequent, and soon become of the colour and consistency of rice-water or thin gruel. Owing to the great loss of water, other secretions are lessened, the urine becomes totally suppressed, the skin shrinks and assumes a grey tinge, the calves and other muscles are cramped, and the patient suffers from an unquenchable thirst. The third stage may be asphyxia or reaction. In the asphyxial stage the skin becomes dark grey and the circulation of the blood becomes more and more sluggish, until the cutting of a vein fails to produce any outflow of blood. If the patient survives he proceeds to the stage of reaction, when cyanosis vanishes, the evacuations resume their yellow colour, the urinary secretion returns, and the circulation improves. There is always danger of a relapse, and the occurrence, the so-called *C.* typhoid, may lead to death. The average rate of mortality in an epidemic is about 50 per cent. Curative treatment should commence with the preliminary diarrhœa. When *C.* is threatened, all cases of diarrhœa should be suspected. The patient should take to bed and endeavour to produce a mild perspiration. Transfusions of hypertonic alkaline saline should be given; a suitable solution is 180 grains of sodium bicarbonate and 90 grains of sodium chloride in one pint of sterile water. Opium, morphia, and alcohol are to be avoided. Potassium permanganate should be administered *per anum* in all cases of *C.* to oxidise and so destroy the toxins produced by the germ in the intestine; Kaolin is also useful for the same purpose. Barley water can be given to combat the dehydration, even if vomiting occurs. Preventive measures are of the utmost importance when *C.* is threatened. There should be the utmost cleanliness in everything concerning the water supply and the disposal of sewage. Travellers should be kept under inspection, and public authorities should thoroughly disinfect all dustbins, water-closets, etc., whether owned privately or not. The individual should practise personal cleanliness, boil all water and milk before drinking,

avoid uncooked fruit and excess in alcoholic liquors, but should endeavour to make as little change in his habitual diet as possible. It should be remembered that any gastric disturbance acts as a predisposing factor, and even undue alarm may therefore indirectly cause an attack. Vigorous people of middle age are seldom attacked, and the number of cases seldom exceeds 2 per cent of the pop. Owing to the difficulty of completely safeguarding food and drinking-water in India, persons living in *C.* dists. are best protected by inoculations of the dead *C.* germ.

Cholera nostras, European *C.*, or summer *C.*, is a disease which occurs in scattered cases and in its symptoms provides a mild parallel to Asiatic *C.* It generally occurs in summer, and should be treated by frequent doses of tincture of opium. See J. S. Chambers, *Conquest of Cholera*, 1938.

Cholesterin, alcohol occurring as a constituent of bile, gall-stones, egg-yolk, nervous tissues, and blood. It is a white crystalline substance, soapy to the touch, insoluble in water, but soluble in hot alcohol or chloroform. It is said to neutralise snake-poison.

Cholet, tn., France, in the dept. Maine-et-Loire, situated on the r. b. of the Maine, 30 m. S.W. of Angers. Cotton and woollen goods, flannels, handkerchiefs, etc., are manufactured and there are bleaching and dye works, and tanyards. A dark granite is obtained in the neighbourhood. *C.* possesses large cattle markets. Pop. 20,500.

Choliambic, name of an iambic trimeter, which had a spondee or trochee instead of the normal iamb in the sixth and last foot. It was called the limping iambus and was used by Gk. and Rom. poets to give a satiric or ludicrous effect.

Cholm (Chelm or Kholm), tn. in Poland, important railway junction from which lines radiate N. to Brest-Litovsk, S. to Lvov, E. to Kovel, and W. to Lublin. Sev. actions were fought in this dist. during Aug. and Sept. 1914 as a result of which the Russians swept over it into E. Prussia, only to be driven beyond it again by the autumn of 1915.

Cholmondeley, Mary (d. 1925), Eng. novelist, granddaughter of Mary Heber, sister of Bishop Heber, the hymn-writer. Her *Red Pottage* (1899), won considerable success. She had previously written three other novels: *The Duncovers* (1887), *Sir Charles Duncovers* (1889), and *Diana Tempest* (1893). Her later novels included *Moth and Rust* (1902) and *The Lowest Ring* (1908), which, however, although excellent for their craftsmanship, did not attain the popularity of her earlier books.

Cholon, prin. commercial tn. of Cochín China, 30 m. from Saigon. Great trade in the rice of Cochín China. Pop. 145,000, chiefly Chinese.

Cholula, tn. 8 m. from Puebla, Mexico, with an anct. Indian pyramid crowned by a Sp. church. Here the Mexican god Quetzalcoatl passed twenty years in teaching the Toltecs the arts of civilisation. The pyramid was erected in his

honour, and crowned with his temple and image. 6000 human victims are said to have been sacrificed annually at this and the other sanguinary shrines in C. It was claimed by Cortés the Conqueror that the sacred city contained 40,000 houses. In 1519 he massacred some thousands of the inhab. Pop. 9000.

Choluteca, dept. and tn. of S. Honduras, with gulf of Fonseca on S., Goascorán R. on W. The tn. is 70 m. from Tegucigalpa, and has large public buildings. Mining is carried on. Pop. 45,000; tn. about 8,000.

Chomatodus, name given by Agassiz to some fossil fish of the group *Elasmobranchii*, is now replaced by the term *Petalodus*. These fishes are typical of the family *Petalodontidae*, and are found in the int. limestone of Great Britain, Europe, and N. America.

Chomolungmar, see EVEREST, MOUNT.

Chomutov, or **Komotau**, tn. of Czechoslovakia, 21 m. S.W. of Teplice, on a trib. of the R. Eger, at the foot of the Erzgebirge. Prior to the Ger. seizure of Czechoslovakia, it had the country's main factory for making railway plant; brewing, milling, weaving, and dyeing were also carried on. In the vicinity are oil mines, and an alum lake. Pop. 33,000.

Chondracanthus, curious genus of parasitic copepod crustacean in which the large females attach themselves to the gills of living fish, and the small males attach themselves to their feminine counterparts.

Chondrites, genus of supposed fossil seaweeds of tucoid form. The species range from the Cambrian to the Tertiary. The specimens on which the genus is based may be simply surface markings which happen to resemble seaweeds.

Chonos Archipelago, group of a thousand rocks, is., and reefs off the W. coast of Chile between lat. 44° and 46° S. They are mostly uninhabited, and are separated from the mainland by the Moraleda Channel.

Chontals, or **Lencas**, widespread race belonging to Central America. Their domain was formerly in the E. parts of Honduras and Nicaragua, and a few straggling settlements in Guatemala, Chiapas (S. Mexico), and Costa Rica. A good number of these people are still to be seen in parts of Nicaragua, and surrounding dists. of Honduras. The Aztecs look down upon the C. and call them aliens or barbarians, but as a matter of fact they are more or less civilised, as proved by ruins and objects found in the graves in dists. where they once dwelt. There are no temples left, or inscriptions on anything, but monoliths 6 or 7 ft. high, stone figures of animals, idols, gold ornaments, and earthenware pots have been found in large quantities.

Chopds, see CHOPRA.

Chopin (O. F. *chopine*, a liquid measure), O. F. liquid measure equal to half a pint; old Scottish measure equal to nearly a quart; Fr. measure, before the introduction of the metric system, equivalent approximately to a *demi-litre*.

Chopin, **Frédéric François** (1810-49),

Polish composer and pianist, b. at Zelazowa Wola, a vil. 30 m. from Warsaw, of Polish-Fr. parentage. His father was a book-keeper and subsequently a teacher. Although he spent half his life in Paris, C. became the greatest exponent of Slavonic, or, more especially, Polish nationality in music. He showed early genius in music and, at the age of nine, began his musical training under Złiwno, a Bohemian and teacher of piano. Through the liberality of Prince Antoine Radziwill he was sent to a Warsaw college, where his genius began to assert



CHOPIN

After a drawing by A. Duval.

itself, and while there he received instruction in composition from Joseph Elsner, a Silesian and director of the conservatoire at Warsaw. Later he became a pupil at the Warsaw Conservatoire, but notwithstanding these successive periods of training C. was largely self-taught. His fellow students at Warsaw introduced him into the best circles of Polish society, and these early impressions of cultured life were of enduring influence on C.'s development, both as a man and as an artist. His début as a pianist was in Vienna in 1829, and his first appearance in public was marked by considerable success. Two years later he proposed to visit London, but, on reaching Paris settled there. Here too he soon became a favourite of society and was the friend of Bellini and of Liszt. Here too began his friendship with Mme Dudevant, otherwise George Sand, who exercised an important influence on his life. When in 1837 his pulmonary trouble began, George Sand, with her children, accom-

panied him to Majorca; but though she nursed him with solicitude, he made no permanent recovery. The last ten years of his life were a continual struggle with the disease to which he succumbed. The revolution of 1848 drove him out of Paris to Britain, where he was a centre of attraction in the chief cities, but eventually he became so weak that when he was to play at some great house he had to be carried upstairs. He went back hysterically to Paris, but only to die on Oct. 17, 1849, and was buried in Père Lachaise cemetery beside Bellini and Cherubini.

C.'s compositions embrace the imaginative melancholy of the Slavonic peasant as well as the grace and culture of the Polish aristocrat, and his character shines out through much of his work. His compositions stand alone owing to the peculiar nature of his genius; they are extremely individualist and of a pronounced style and full of poetic imagery. He employed dance forms and rhythms—particularly the mazurka—round which to weave many of his melodies. He has been well described as the poet of the piano—a lyric poet for the most part, though sometimes a dramatic poet. The list of his compositions is so prolific in mazurkas, waltzes, polonaises, and other forms of national dance music that it is sometimes difficult to believe that they are so often the expression of a deeply melancholy nature—a seeming paradox, yet explained by the type of C.'s nationality, a nationality which has been justly described as sadness personified. What music C. composed for other media than the piano is negligible, for even when he associated other instruments with the piano they were obviously subordinated to it. The piano was to C. as much a means of natural expression as if it were a part of him (Scholes). Among his compositions are 27 études, 24 preludes, 19 nocturnes—the style and name of the pianoforte nocturne he owed to the Irish composer, John Field (1782–1837)—52 mazurkas, 3 impromptus, 3 sonatas, and 2 concertos. Some of these are to-day the most popular of all recital items. Excepting a collection of Polish songs, the 2 concertos above mentioned, and a few concerted pieces of chamber music, almost all the works of C. are written for pianoforte solo; the symphony, the oratorio, and the opera he never attempted. He was among the finest executants as a pianist, and in this art Liszt alone approached him. He was among the first to use the thumb freely on black keys. Many of his pieces, with *cerie* effects or echo effects or fairy-like accompaniments, depend for their adequate rendering on the use of a particularly subtle kind of finger technique, and are indeed a good test of the varied resources of the skilled pianist. (See on this Tobias Matthay, *The Visible and Invisible in Piano Technique*, 1932.)

The house in which C. was born was taken over by the Polish nation in 1934 and extensive gardens laid out. In the Second World War the Gers. stripped it

of all its furniture and things of value; but after the war the Poles gradually collected various pieces of furniture, pictures, etc., which had been saved by the composer's admirers, with a view to furnishing the house at Zelazowa Wola as a worthy place of pilgrimage. The Poles see C.'s music as the noblest expression of the romanticism in their soul; his whole life, his patriotism, his death, and his request that his heart be brought back to Poland all made the strongest appeal to Poland's imagination. The return of C.'s heart to its former resting-place in the Church of the Holy Cross in Warsaw, from where it was removed and hidden from the Gers. during the war, was the occasion of a great national demonstration in which the Polish president and the leading members of the regime took part. Efforts were made to have the remains brought back from France not later than 1949, in time for the centenary celebrations, to be marked also by the pub. of a revised ed. of his works, collected and ed. by Paderewski, and the holding of an international C. congress in Warsaw. Sev. years before the war the C. Institute arranged for Paderewski to edit the revised ed. and to add his own interpretations. Paderewski collected all the various eds., including 19 nocturnes, 14 waltzes, and 7 items which had first been pub. by the Oxford Univ. Press. He found that in the course of a century many errors called for correction and he devoted the last years of his life to completing the task (1939). The new ed. was actually started in 1939 and all the proofs and annotations had to be hidden in a cellar in Warsaw. Because of a lack of printing facilities the proofs were, after the war, sent to America for pub. there in time for the centenary. See C. Hadden, *Chopin*, 1934; W. Murdoch, *Chopin: his Life*, 1938; G. Abraham, *Chopin's Musical Style*, 1939; P. A. Scholes, *The Oxford Companion to Music*, 1941.

Chopine (Sp. *chapin*), very high clog or patten, sometimes half a yard high, of oriental origin, introduced into England from Venice in the reign of Elizabeth.

Chopra, or **Chopda**, tn. in Khandesh dist., Bombay, India, 105 m. from Indore. Exports linseed and cotton. Pop. 18,000.

Chop-sticks, implements used by the Chinese and Jap. to pick up their food with—a substitute for our knife and fork. They are made of either ivory or wood, and held between the fingers and thumb of the right hand in much the same way as sugar-tongs.

Choragus, or **Choregus**, in anct. Greece, the name given to the citizens who bore the expense of the chorus furnished by each tribe for public festivals, and also to the musician who directed the tribal chorus. The most successful C. in competitions was rewarded with an engraved tripod, which he consecrated and set upon a monument. The choragic monuments of Thrasylus and Lysicrates still exist at Ath.-ns.

Chorale (Ger. *Choral*), name applied to a particular form of musical composition

for voices which was introduced by Luther into the services of the Ger. Reformed Church. The words were often in the vernacular and in the form of hymns. The music was not always original, being sometimes secular and sometimes adapted from hymn tunes of the Rom. Church. Luther and his friends, Walther and Senfl, pub. the first important set of chorales at Wittenburg in 1524.

Choral Service, services in the Eng. and Rom. churches where the psalms, responses, etc., are sung, not said.

Chord, in music, the simultaneous sounding of notes of different pitch. The common C. consists of a note with its third and fifth. In geometry, a C. is a straight line joining two points on the circumference or curve of a circle, ellipse, parabola, etc. In a circle, the greatest C. is a diameter, and the length diminishes as it recedes from the centre. The perpendicular drawn from the centre bisects the C.

Chordata, term used in speaking of all animals which have at some period of their life the organ which functions as a supporting rod, the *notochord*. In some of the lowest members of the group this elastic rod is present only in the earliest stages of their life, while in the highest members it is eventually replaced in the adult by the spinal column. Other universal features are the presence of gill-slits and a central nervous system. Zoologists are by no means agreed upon the creatures which may be included in the C., and though the Amphioxus and all vertebrates have an assured position, opinions vary as to the claims of such lower forms as the Tunicata and Enteropneusta.

Chorea, or St. Vitus's Dance, nerve disorder which attacks both children and adults, but most cases occur in the former between about eight and fifteen years of age. That occurring in childhood is called 'common C.' and is met with much more frequently among girls than among boys. Its presence is shown by nervous twitchings of the head, face, or limbs, due to great want of control over the muscles of the affected part, but unaccompanied either by pain or rigidity. The muscles of the face are most frequently affected, then the extremities of one side of the body, and after them come those of the body, and in very severe cases all at once. The disease has probably a connection with rheumatism, since it occurs generally in children with a rheumatic tendency, and sometimes is accompanied by acute rheumatism, or there is even danger of rheumatic fever. Also there are symptoms of heart disease, which may be brought on in its lower stages. A child which suffers from C. has probably been subjected to some shock or fright, and the remedy is complete rest; or there has been malnutrition, when a course of nutritious feeding would be necessary. The patient should be confined to her own room and in bed, and in order that she shall suffer from no excitement, contact with friends or relatives forbidden. Nutritious diet and a metallic tonic, such

as zinc, iron, or arsenic, may be given, but the most efficacious drug is aspirin. The attack generally lasts about two months, but as it is liable to return, the child should be given plenty of open-air exercise, gymnastics, and good feeding.

Choreography, art of dancing notation, i.e. a system of signs whereby movements in dancing is shown, the same as notes in music represent certain sounds. Beauchamps, the dancing master of Louis XIV., developed this art. Saint-Léon wrote one of the best works on this subject entitled *Sténochoregraphie* (1852). The term now connotes the whole invention, design, and stage management in a ballet.

Choriambus, in classical prosody, a foot consisting of four syllables, of which the first and last are long, the second and third short (— — — —). It takes its name from its supposed composition from the union of a trochee (choree) and an iambus.

Chorion, term which has been used in sev. confused senses by embryologists in connection with the early development of mammalian young. It was applied particularly to the union of the false amnion with the allantois or with the yolk-sac, but it is now generally eliminated from the vocabulary of scientists.

Chorley, municipal bor. and tn. of Lancashire, England, situated on the R. Chor, 20 m. N.W. of Manchester. The manuf. of cotton yarn and goods is largely carried on, and there are calico printing, bleaching, and iron works. Coal, iron, lead, and slate are found in the neighbourhood. Pop. 31,000.

Chorlu, or Tchorlu, tn. and riv. in Turkey, 60 m. W. by N. of Istanbul. Scene of much sanguinary fighting between the Turks and Bulgarians in 1912.

Chorokh, or Zhorokh, riv. of Transcaucasia. It rises on the side of Kazan Mt. N. of Erzerum. It is about 215 m. long, and drains 10,500 sq. m. of country. It flows into the Black Sea near Batum. Its chief trib. is the Olti-chai.

Chorostkov, tn. formerly of Poland in W. Ukraine, 25 m. E.S.E. of Tarnopol. Pop. 6,500.

Chorotegans, one of the cultured races of Central America. Their land extended from Fonseca Bay to the E. side of Lake Nicaragua. At present they have nearly all become swallowed up in the Sp.-Amer. communities of Honduras and Nicaragua, and as a matter of fact they now form the main constituent element. They acquired a fairly large amount of culture under Aztec and Maya influence, but the early missionaries who came over from Spain had their temples destroyed, their idols broken, and their graves despoiled. On the is. of Lake Nicaragua are some colossal basaltic monoliths which are supposed to be of Chorotegan origin. They are for the most part in the form of human figures, but very rudely carved.

Chorrera, tn. near the Pacific coast of Panama, 15 m. from Panama. Pop. 6,200.

Chorum, or Corum, tn. in Asiatic Turkey, 100 m. N.E. of Ankara. It is

situated on the road which runs between the seaport of Samsun and Kaisarieh. This makes it a place of some commercial standing. The manufs. are earthenware and leather. Pop. 12,500.

Chorus, word which originally in Gk. meant a dance (*χορός*) accompanied by singing, employed at festivals in honour of the gods, especially of Dionysus, and thus developed into the songs accompanied by rhythmic movement forming the lyric parts of the Gk. tragic and older comic drama. It is thus applied to the body of singers in opera, oratorio, cantatas, etc., who sing the music written for large groups of voices in parts for each type of voice, soprano or treble, contralto or alto, tenor, and bass. A C. may be distinguished from a glee which is properly written for single voices to each part. Hence when a portion of a song is to be sung, not by a single singer but by a number of singers, it is styled a C. In the Elizabethan drama, the word is applied to a single character who spoke the epilogue and prologue.

Chorzow (Ger. *Königshutte*), tn. in Polish Silesia. It has rich coal mines, and also iron and zinc works. Pop. 111,000.

Chose in Action, in its general significance, means all rights over property which, in contradistinction to those which can be asserted by taking physical possession of the property, can only be enforced by action. It is, however, a term of many shades of meaning, all of which have been the subject of much legal controversy. In its other but related senses it may mean the property itself which is the subject of personal rights or the instrument which evidences those rights. In the sense of the property itself the term has been held to comprise, *inter alia*, shares and stock in companies, insurance policies, patents, debentures, titles, negotiable instruments, debts of all kinds, annuities, trusts, legacies, reversionary interests, and advowsons. In contradistinction to choses in possession (a thing of which a person has physical possession), Cs. in A. were not transferable at common law, but by the custom of merchants, the rules of equity and statute law, certain Cs. in A. became assignable, and hence it was that prior to the Judicature Act, 1873, Cs. in A. were commonly classified according to the mode of assigning them. Cs. in A. not being assignable at common law, the result was that a person who purported to assign could not maintain an action in his own name against the debtor. But by the Judicature Act, 1873, all Cs. in A. are made assignable by agreement in writing signed by the assignor, provided written notice is given to the debtor or trustee, and the assignment is absolute and not by way of charge. See L. A. Goode, *The Modern Law of Personal Property*.

Cho-Sen, see KOREA.

Choshi, tn. in Japan on the E. coast of Nippon, 72 m. from Tokyo. The chief industry is fishing, and fish oil is manufactured. Pop. 36,500.

Chos-Malal, cap. of the Neuquen ter.,

Argentina, at the junction of the Neuquen and Leubu, 465 m. from Bahía Blanco. Altitude 2590 ft.

Chosroes I., reigned over Persia A.D. 531 to 579. His name C., or rather Khosrau, means 'with a good title,' and his wise and beneficent rule earned him the appellation of Blessed (Anushirvan). In 540 he broke his peace with the Emperor Justinian, invaded Syria, and carried off the inhabs. of Antioch to a new city called Khosrau-Antioch. In 562, after successive warfare against the Roms. in Lazica (Colchis) and Mesopotamia, he made a peace whereby the Roms. agreed to pay subsidies but kept Lazica, whilst C. agreed not to persecute the Christians. Uniting later with the Hephthalites against the Turks, C. proceeded to conquer Bactria, and in 570 he made Yemen a Persian dependency. This ruler was therefore a great conqueror, but he was also a great statesman; for he introduced a land basis for taxation, built canals in Babylonia, was tolerant towards Christian and other sects though a convinced Zoroastrian, and patronised literature.

Chosroes II. (A.D. 590-628), was far inferior both in statesmanship and strategy to his grandfather, C. I. Prone to luxury, he succeeded finally, by his haughty bearing and heedless avarice and cruelty, in alienating the affections of all his people and in reducing the mighty Persian empire to a state of miserable and desperate chaos. With the help of the Emperor Maurice he defeated the usurper Bahram Chobin in 591. Three years later he began war against the Christians and Rome, ostensibly to avenge the murder of his ally, Maurice. His predatory armie overran Syria and Asia Minor, and his general, Shahrbaz, captured Damascus and Jerusalem (614). Even Egypt fell a victim to Persian rule. But between 622 and 629 the Emperor Heraclius recovered all the recent conquests and restored the Holy Cross to Jerusalem. C. was assassinated, his eldest son being proclaimed king in his stead.

Chota Nagpur, div. of Bihar prov., India. It includes, besides the Brit. dists., sev. small native trib. states between the valleys of the Rs. Mahanadi and Son. The country is ill-watered and liable to drought, its highlands are thinly peopled and contain a large aboriginal pop. Everywhere are jungles and forests. Lac, rice, tea, silk, and timber are produced. At Jherria and in other places coal and iron are mined. Many of the hillmen are now Protestants. Pop. nearly 5,000,000. Consult Bradley-Birt, *Chota-Nagpur*, 1910.

Chota Udaipur, hilly native state in the Gujarat States Agency, India, with a cap. of the same name. Area, 900 sq. m. Pop. 145,000.

Chou Carabe, see BRAZIL CARBAGE.

Chouans, lower Breton word, meaning 'screech-owls.' This name was given to a company of smugglers, who revolted during the F. Revolution and joined the Royalists in La Vendée. They were led by a man called Jean Cottoreau (1767-94),

a dealer in contraband salt, whose trade was ruined by the destruction of the inland customs. Under his leadership the C. carried on a guerrilla warfare against the Republicans; his company soon grew into an army which was known as *La Petite Vendée*. Cotteureau was killed in an ambush, and his place was taken by Georges Cadoudal (1771-1804). The insurrection then spread through Brittany and the W. of France. The devotion of the Bretons and the energetic skill of Cadoudal made this revolt a menace to the republic. The little army had grown



F. Full

CHOW-CHOW

to 10,000 men, who regarded the revolt almost as a holy war; they were finally beaten by La Hoche at Quiberon (July 20, 1795). Cadoudal was imprisoned but escaped, and though open warfare was now impossible, he continued plotting; he was arrested and executed in Paris, June 1804, with sev. others. This ended any serious attempt at a fresh revolt. See also *VENDÉE, LA*.

Choudard, Pierre Jean Baptiste, see *DESFORGES*.

Choughs (*Pyrrhocorax*), group of the crow family or Corvidae. It includes sev. species, of which the rare Cornish C. (*Pyrrhus graculus*) is an example. They are allied to the magpies and jays; the name is given to them in imitation of their cry. The species are usually black, with red feet, and a long, powerful yellow or red beak; the claws are long and hooked. In diet the C. are frugivorous and insectivorous. The Alpine Cs. (genus *P. pyrrhocorax*—Linn.) differs from the true C. in its shorter bill, and in having the cheeks bare, not feathered as in the genus *Graculus*. Only one species of this genus is known.

Chouquet, Adolphe Gustave (1819-1886), Fr. musical writer, b. at Havre. He composed sev. light works, but is best known as a writer on musical hist. In 1871 he became keeper of the collection of musical instruments at the Paris Conservatoire de Music, and he issued an illustrated catalogue of that collection

in 1875. His chief work is *L'Histoire de la Musique dramatique en France* (1873).

Chow-show, or **Chow**, Chinese dog, popular in Great Britain as a pet dog. In China it is killed and hung up for sale in the meat-shops. It has a piquant expression, is an intelligent companion, and a good house dog. Its chief peculiarity is that it has a black tongue. Occasionally the roof of the mouth is also black. Its coat should be all of one colour—black, red, yellow, blue, or white—but not in patches. White spots on the coat are a disqualifying point. The hair under the tail and under the thighs is frequently of a lighter shade in the same colour. Other points to notice are: Head broad and flat; nose moderate in length, but short tipped; nose and mouth black; eyes small and dark; ears alert and carried erect and well over the eyes; neck broad and firmly set; legs strong, bony, and perfectly straight; feet round and cat-like; chest broad and deep. The C. has a deep ruff round the neck, and a hairy, full tail, curled over the back. It weighs from 46 to 55 lb.

Chree, Charles (1860-1928), Scottish scientist, b. in Forfarshire and educated at Aberdeen and Cambridge Univs., gaining the highest honours in both. In 1890 he was appointed a fellow in research at Cambridge. He soon achieved great distinction in the study of terrestrial magnetism and atmospheric electricity, in which he became a recognised authority. Was superintendent at Kew Observatory from 1893 till 1925, during which period that observatory was developed into one of the best in the world. Among his many honours and awards were the James Watt medal in 1905, the Hughes medal in 1919, awarded by the Institution of Civil Engineers and the Royal Society respectively. Pub. *Terrestrial Magnetism* (1912) besides numerous papers on that and allied subjects.

Chrestien, Florent (1541-96) Fr. satirical poet, b. at Orleans. One of the co-authors of the *Satyre Ménippée* (1594), directed against the League. A composer of Lat. verse and a good Hellenist, he was chosen as tutor to the prince de Béarn, afterwards Henry IV.

Chrestomathy (Gk., good learning) collection of the best extracts from any author or authors, with notes. The term is especially applied to such a compilation in a foreign language, viz. a Hebrew C. The best one of modern times is G. Paris's *Chrestomathie du moyen âge* (1908).

Chrétien (or Chrestien) de Troyes, most famous of Fr. medieval poets. He was b. at Champagne, but unfortunately there are but few exact details with regard to his life. There is also a difference of opinion as to the dates of his poems. At the command of Marie, countess of Champagne, he wrote *Le Chevalier de la Charette*, and he wrote *Le Conte du Graal*, or *Perceval*, for Philip, count of Flanders. This prince was regent for the young king Philip Augustus from 1180 to 1182, and as C. says the story of the Graal was the best tale told *au cort royal*, we have reason to believe that it was written during the

regency. It is thought that the probable time of his literary activity was between the years 1150 and 1182, when his patron, Count Philip, fell into disgrace at court. There are a few of C.'s poems extant, most of them dealing with Arthurian legends. There also exists a poem entitled *Guillaume d'Angleterre* which is supposed to have been written by him, but it is a matter of debate. Prof. Förster claims it as a genuine article, but Gaston Paris does not accept the statement. His poems enjoyed great popularity, and the three favourites were *Erec*, *Yvain*, and *Perceval*. His style of writing is easy and graceful, and he is also analytic and dramatic, but he has no great depth of thought or power of characterisation. His MSS. are the earliest Arthurian romances that we possess. See A. C. L. Brown, *Ivain*, 1903; T. P. Cross and W. A. Nitze, *Lancelot and Guinevere*, 1930; F. W. Thompson, *The Elucidation. A Prologue to the Conte del Graal*, 1931; A. Micha, *La Tradition manuscrite des romans de Chrétien de Troyes*, 1939.

Chrism (Gk. *χρίσμα*, a substance used in anointing, from *χρίω*, to anoint), and consecrated olive oil mixed with balm, used by the Rom. Catholic Church for anointing in certain sacraments; in the Orthodox Church it is mixed with spices. Children were anointed before being baptised.

Chrisome, robe presented to infants when baptised in the Rom. Catholic faith, to symbolise innocence. It represents the original C. cloth which used to be placed on the head to prevent the chrism oil being rubbed off. A C. child is one who dies within a month after baptism, in which case the C. is used as a shroud.

Christ, transliteration of the Gk. *χριστός*, anointed, from *χρίω*, to anoint, usually with the definite article 'the anointed one, the Christ,' and used in the Septuagint version of the O.T. to translate the Heb. *Mashiyaḥ*, Messiah, the anointed one, a word which to the Jews of latter times implied the great earthly King who would restore their kingdom and free them from the subjection in which they were held (see MESSIAH). While in the O.T. the word is used in the LXX. not always with this significance of a Messianic coming, in the N.T. it always refers to the claim of Jesus, to fulfil the Messianic prophecies, but in a spiritual sense as the bringer to mankind of a spiritual kingdom and of freedom from the subjection not to earthly rulers, but to sin. C. is thus properly a title of Jesus, the Lord, (Κύριος) Jesus, the Christ (ὁ Χριστός). When He asks His disciple, 'Whom think ye that I am?' Peter answers, 'The Christ.' The high priest asks Him if He is 'the Christ.' In the beginning of the earliest certain Christian document that we possess, the first epistle of St. Paul to the Thessalonians, most probably not later than A.D. 52, the Church is addressed as in 'the Lord Jesus Christ.' It may be noted that 'Christ,' alone with 'Jesus' or 'Lord Jesus,' is far more frequent in the Epistles

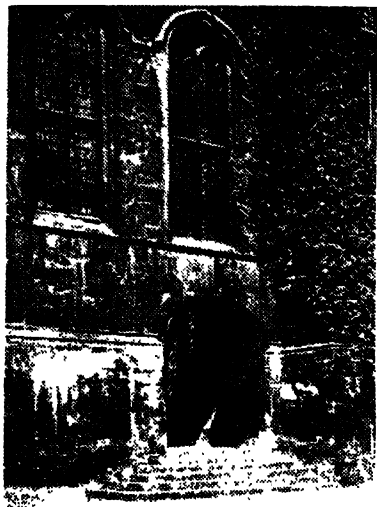
and Acts than in the Gospels. From the earliest time it is the spiritual Messianic side of Jesus' mission that is stressed, and it is plain how the name of His followers should have been from the first 'Christians' (Χριστιανοί). The first letters of the name in Gk. *Χ.Ρ.* formed the monogram of Constantine's *labarum*, and have always remained a favourite symbol in Christian art. See also JESUS CHRIST and MESSIAH.

Christ, Disciples of, or Campbellites. religious sect founded by Alexander Campbell (1788-1866). They do not have any creeds or confessions, they take their religious ideas direct from the N.T., and baptise by total immersion. In the U.S.A. they have grown into an influential body.

Christadelphians (Gk. 'brethren of Christ'). A religious community founded by Dr. John Thomas (b. in London in 1804) but claiming to hold the doctrines of primitive Christianity. They believe in the unity of God; in Jesus Christ the son of God, who died as a sacrifice that men might have life; in immortality as a conditional gift to be bestowed at the resurrection of the dead at the return of Christ to establish a universal kingdom upon earth. They believe the centre of gov. will be in Palestine with Jerusalem as cap. See J. Thomas, *Elpis Israel*, 1850; R. Roberts, *Christendom Astray*, 1881; J. Carter, *God's Way*, 1947.

Christ Church (Lat. *Aedes Christi*, popularly called 'The House'), college of Oxford Univ., England, and the largest collegiate foundation in Oxford. It was commenced by Cardinal Wolsey in 1525, on the site of the priory of St. Frideswide, which Wolsey had suppressed on Pope Clement VII.'s authority, for the purpose of founding a college. The church of St. Frideswide became both the cathedral of the diocese of Oxford and the college chapel. The college was first called Cardinal College, and on the fall of Wolsey, Henry VIII. suppressed the name and called it Henry VIII.'s College. In 1546 the foundation was established as it now exists, consisting of a dean, who is head of the college and dean of the cathedral, six canons, the cathedral staff, and the 'students,' the fellows (senior students), and scholars. Five of the canons are university professors; the duties of a college dean are performed by two of the fellows called censors. Wolsey began the buildings and in 1663 Dr. John Fell completed many of them, though the cloisters Wolsey had designed were never built. The great gateway begun by Wolsey was finished by Dr. Fell and designed by Wren; it contains the great bell called 'Big Tom' (St. Thomas of Canterbury), which came originally from Osney Abbey. The first quadrangle, the largest in Oxford, is called the 'Tom Quad.' The Peckwater Quadrangle is named from a hall that once occupied the site, and the small Canterbury Quadrangle is called after the Canterbury College, built in 1363, which vanished in Wolsey's foundation. The staircase leading to the hall is roofed with one of the most beautiful examples

of fan vaulting, interesting for its late date, 1640. The hall is the finest in Oxford, and boasts some splendid portraits; among them are Holbein's 'Henry VIII., 'Wolsey,' and others of the many distinguished former members of the college. The library contains a very valuable collection of books, also Wolsey's cardinal's hat. The cathedral is small and cruciform. There are traces of Saxon work, but in 1160 it was restored and made Norman. Wolsey altered it considerably, and Sir Gilbert Scott restored the E. end



John H. Stone

THE CATHEDRAL OF CHRIST CHURCH

in the nineteenth century. The building contains specimens of every Eng. style. There is a fine Jacobean pulpit. The nave roof is woodwork, and the choir is rooved with fan tracery in stone. There are some beautiful windows by Sir E. Burne Jones, some fourteenth-century glass, and a curious Dutch window by Abraham van Ling, 1630. The cathedral contains many interesting tombs, and the shrine of St. Frideswide has been discovered and reconstructed. Between the college and the meadows runs the famous Broad Walk planted and laid out by Dr. John Fell in 1670.

Christchurch, tn., Hampshire, England, situated at the junction of the Avon and Stour, on the edge of the New Forest, close to Bournemouth. It possesses a beautiful church, the priory church of the Holy Trinity, a cruciform edifice, without the central tower, and having a Perpendicular tower at the W. end. The nave and transepts are mainly Norman. The priory of C. is mentioned in Saxon documents as Twineham, and in 901 it was

seized by Ethelwold (A.-S. Chron.). About 1095 it was partially rebuilt and endowed by Ranulph Flambard, bishop of Durham. It contains the poet Shelley's monument and many others of interest. The ruins, of a Norman castle, built by Richard de Redvers in Henry I.'s reign, are close to the church. The bur. was first summoned to send representatives to Parliament in 1307. Pop. 9000.

Christchurch, largest city of the Is. of New Zealand, was intended from the outset to be the cap. of the prov. dist. of Canterbury. It is situated on the Avon and Heathcote Rs. and extends from the hills of Banks Peninsula to the sea. While the industrial and business areas and most of the residential dists. are on level land, there are many hillside suburbs and seaside resorts. The Avon and Heathcote Rs. are small slow-flowing streams, ideal for rowing in the upper reaches and for small pleasure craft by the sea. C. is known as the 'Garden City' of New Zealand, being celebrated for the many fine parks and open spaces, boulevards and riverside reserves. Canterbury Univ. College includes an engineering school with a world famous reputation. The Anglican cathedral in the centre of the city (Cathedral Square) is one of the finest buildings of the kind in the S. hemisphere. The museum contains many exhibits of interest, including the bones of the moa (q.v.). The largest of the many parks, known as Hagley Park, comprises just under 500 ac. The city, as the commercial centre of the rich Canterbury Plains, is highly industrialised and contains many industries connected with both primary and secondary production. It is rapidly becoming the chief manufacturing centre of New Zealand because of the unlimited facilities for expansion, the wide streets and highways radiating in all directions, and the fine municipally owned aerodrome on the outskirts of the city. Lyttelton, the port of C., is approached by road and rail, the latter being a direct route through the tunnel in the hills to the port only 7 m. from the heart of the city. A tunnel road is planned to give the city additional access to the port. Pop. of the city (metropolitan area) 164,000.

Christening, see BAPTISM.

Christian, term applied to a follower of Christ. According to Acts xi. 26, 'the disciples were called Christians first in Antioch,' that is about the year 43. The word only occurs in two other places in the Bible (Acts xxvi. 28, and 1 Peter iv. 16). It is probable that it was not used by the disciples themselves, but was a contemptuous nickname given by their enemies (cf. Tacitus, *Annal.* xv. 44). According to Baur, the name meant, by its derivation in *ianus*, have sprung up first among the Romans, not among the Gks. The name could not have originated among the Jews, who called the disciples Nazarenes and Galileans and would not have given them a name which meant 'followers of the Anointed.' The early Cs. were sometimes called *Chrestiani*, by a mistaken derivation of the word

from *χρηστός*, good, instead of *χρίειν*, to anoint.

Christian, name of sev. kings of Denmark and Norway:

Christian I. (1448-81), *b.* 1426. He was also king of Sweden (1457-71), and was elected duke of Schleswig-Holstein (1460). He founded the univ. of Copenhagen in 1478.

Christian II. (1513-59), *b.* 1481, king of Denmark, Norway, and Sweden, son of King John of Norway and Denmark and Christina of Saxony, married Isabella of Burgundy. On his accession the Swedes refused him as king, and headed by Sten Sture held out against him for some time, but were finally defeated at Upsala, 1520. After the heads of the nation had sworn fealty, he gave a banquet and had most of his guests seized and imprisoned. About eighty-two persons were executed or drowned by his order the following day (the Stockholm massacre). Sweden revolted successfully, while his system of taxation made him hated in Norway and Denmark. Jutland revolted and gave the Danish crown to Duke Frederick of Holstein in 1523. After a long struggle C. was compelled to surrender to King Frederick in 1532, and was kept in solitary confinement for twenty-seven years. His passion for his mistress, a Dutch girl of the people named Dyveke, has added greatly to his unpopularity, but he was possessed of great energy, courage, and patriotism. He died in 1559.

Christian III. (1535-59), *b.* 1503. During his reign he witnessed the completion of the Lutheran Reformation.

Christian IV. (1588-1648), *b.* in Fredriksborg, Zealand, in 1577. In 1611-13 he waged war with Gustavus Adolphus of Sweden, which terminated in the peace of Knärd. During the Thirty Years war he suffered defeat in 1626 from Tilly at Lutter-am-Barenberge and Jutland was raided by the enemy's troops. He again fought with Sweden from 1643 to 1645, and by the peace of Brömsebro was obliged to yield a great part of his ter. around the Sound. C. IV. was, however, a just and broad-minded king, and won great popularity among his subjects for his attempts to emancipate the peasantry. He was energetic in promoting commercial enterprise and encouraged science and industry. He founded Christiania, the present cap. of Norway, in 1624 (now named Oslo).

Christian V. (1670-99), *b.* 1646, was the first king of the Oldenburg dynasty. During his reign Denmark acquired the is. of St. Thomas and St. John in the W. Indies.

Christian VI. (1730-46), *b.* about 1699.
Christian VII. (1766-1808), *b.* 1699, son of Frederick V. He was a man of weak intellect, and rule was exercised by his ministers, Struensee and Bernstorff. His wife, Caroline Matilda, sister of George III. of England, and his son, Frederick, acted as regents from 1784 till his death.

Christian VIII. (1839-48), *b.* 1786.
Christian IX. (1863-1906), *b.* 1818. He is closely connected by marriage with

many of the thrones of Europe. His daughter, Alexandra, married King Edward VII. of England; another, Dagmar, married Tsar Alexander III.; while his second son, George, became king of Greece (1863). In 1864 C. lost Schleswig-Holstein in war with Austria and Prussia. He has been succeeded by Frederick VIII.

Christian X (1870-1947), baptised with the additional names Carl Frederik Albert Alexander Vilhelm, king of Denmark and Iceland, was *b.* at Charlottenlund Sept. 26, 1870; son of Prince Frederik, later Frederik VIII., and of Princess Louise of Sweden and Norway. He matriculated in 1889, joined the army, and rose to be major-general. He married Alexandrine, duchess of Mecklenburg-Schwerin, in 1898; in 1906 he became crown prince; and he succeeded to the throne of Denmark and its dependencies on the death of his father, May 14, 1912. The chief features of his reign have been: the co-operation (beginning with the meeting at Malmö in Sweden, Dec. 18, 1914) of Sweden, Norway, and Denmark, as neutrals during the First World War, the enfranchisement of women as part of a new constitution granted in 1915; the erection of Iceland into a separate kingdom under the same head on Dec. 1, 1919; and the re-acquisition of N. Slesvig from Germany at the end of the war. During his reign he made a number of visits to his other kingdom of Iceland, and he also went to Greenland, being the first Danish monarch to do so. It was a cause of grief to him that the Althing and Gov. of Iceland should have decided to sever the bonds between the Icelandic people and Denmark. When, however, an Icelandic republic was declared in 1944, he sent the Icelandic Gov. a generous message of goodwill. C. will be remembered by the Danish people for the courage with which he upheld his people's rights during the perilous years of the Ger. occupation. On April 9, 1940, in face of the Ger. ultimatum stating that if Denmark resisted Ger. invasion, Danish cities would be bombed, he gave way on the advice of his Prime Minister (Dr. Stauning) and of his foreign minister (Dr. Munch) and no resistance was made. So far as he was able he maintained a show of independence in his relations with the Gers., but he continued on the throne on sufferance. Nevertheless he provided in his person a rallying point for Danish patriotism and sentiment, and the fervour with which he was acclaimed when he appeared in public bore witness to his popularity with his subjects, which never waned.

Christian, Prince, Frederick Christian Charles Augustus (1831-1917), prince of Schleswig-Holstein-Sonderburg, was *b.* Jan. 22, 1831, son of Duke Christian August. After his marriage, Prince C. became a general of the Brit. Army, and high steward of Windsor Park, where he had his residence, Cumberland Lodge. In 1866 he married Princess Helena Augusta Victoria, *b.* 1846 and *d.* June 9, 1923, the third daughter of the late Queen

Victoria, renowned for her philanthropic work with regard to hospitals and charitable institutions. Their eldest son, Prince Christian Victor, was killed during the Boer war, 1900. He d. at Schomberg House, Pall Mall, Oct. 23, 1917.

Christian Brothers. Rom. Catholic institute, founded at Waterford, co. Kilkenny, Ireland, in 1802, by Edmund Ignatius Rice. Rice had resided in that city as a merchant since 1780, and his pity had been excited by the deplorable state of ignorance and vice in which the poor lived. In 1803 a monastery was built for the school by the citizens of Waterford. Rice received the support of the bishop of Waterford, and was before long asked to open houses of the institute in many tns. of Ireland. There are now 200 schools of the C. B. in Ireland, England, Australia, India, and N. America. In 1820 they were granted a constitution by the Holy See, and confirmed as a religious institute of the Rom. Catholic Church. When the Irish national system of education was estab. (1831), the C. B. for a time accepted the grant by placing their schools under the Board, but they later withdrew from the connection as they could not separate secular from religious teaching. The title has erroneously been given to the Brothers of the Christian Schools, a brotherhood of laymen bound by three religious vows, founded by the Abbé J. B. de la Salle for the education of the poor, in France (1684). The training college estab. at Rhelms in 1685 was the first of its kind in the world. There are now, in all parts of the world, about 300,000 pupils of the brotherhood. The system of elementary education given by these Fr. schools was adopted by Rice in drawing up the rules for his Irish institute.

Christian Catholic Church. see under DOWIE, JOHN ALEXANDER.

Christian Connection. sect for banding together Christians who have no definite creed. They take the Bible as the foundation of their belief and conduct. They were founded in America in the early part of the nineteenth century. Their views are much the same as those set out by Chillingworth in his *The Religion of Protestants a Safe Way to Salvation*, 1638.

Christian Endeavour. The Christian Endeavour (C. E.) movement originated in Williston Congregational Church, Portland, Maine, U.S.A. in 1881. It was formed by Dr. Francis K. Clark, who later became the first world president. The movement was formed to hold and train young Christians in and for the Church. Its motto 'For Christ and the Church' indicates its supreme purpose. The success of the first society led to the extension of the movement in other churches, not only in America but throughout the world. While its emphasis is upon the devotional life, it seeks to train young people to apply their faith to every aspect of life; thus, through its weekly topics, it focuses attention upon the missionary spheres and Christian citizenship. Its work is interdenominational, not undenominational, and is found in all the evangelical denominations

of the Church, where it enjoys full recognition. It is international, having been estab. in Canada (1863), India (1883), China (1885), Great Britain (1887), S. Africa (1887), Australia (1888), France, Spain, Burma (1888), Turkey (1889), Sweden (1890), Jamaica, New Zealand (1891), Japan (1893), Germany, Switzerland (1894), etc. In each country the work is controlled by a national C. E. union, which has local unions to cover its constituency. The whole is co-ordinated in the world's C. E. Union. While the local society is pledged in its first loyalty to the church with which it is attached, its fellowship extends to all similar societies. Societies are graded according to age groups, thus its membership reaches from childhood to riper years. As the pioneer of Christian youth work it is still virile and active throughout the world.

Christian Knowledge, Society for Promoting. founded in 1693 by four laymen, Lord Guilford, Sir Humphrey Mackworth, Mr. Justice Hook, and Col. Colchester, and one parson, Dr. Thomas Bray (*q.v.*), who met, probably in Hook's chambers in Lincoln's Inn, to discuss the provision of church schools in London parss., the catechising of the children of the poor, the conversion of Quakers, and Dr. Bray's scheme for promoting religion in the plantations (colonies). The directing mind was that of Bray (1658-1730), rector of Sheldon, near Birmingham, one of the most far-sighted churchmen of his age. Appointed commissary to Maryland by Compton, bishop of Birmingham, he estab. lending libraries in that settlement and, later, at home. As a result of his preoccupation with the eccles. affairs of Maryland, he drafted *A General Plan of the Constitution of a Protestant Congregation or Society for Propagating Christian Knowledge*. This document is preserved in the library of Sion College. Bray's original scheme contemplated a 'congregation *pro Propaganda Fide*,' a society incorporated by royal charter, consisting of clergy and laymen who 'should meet and consult upon the best means and methods of promoting religion and learning in any part of His Majesty's plantations abroad'; to supply and support a missionary clergy; and to estab. parochial libraries throughout the plantations; and further, in order to arrest 'the terrible decay of religion in this kingdom,' they were to provide clerical lending libraries in mkt. tns. and 'set up catechetical schools for the education of poor children in reading and writing and especially in the principles of the Christian religion.' This was an ambitious project and, after Bray's return from Maryland, it was evident that the work was more than a single society could cope with; and the result was that, while the S.P.C.K. continued to work with no restrictive charter, a separate society for the propagation of the gospel in foreign parts was founded in 1701, with a royal charter. To both societies, founded by Bray, the Anglican Communion owes a great debt. As a church publishing society the S.P.C.K. exercised great influence in

moulding clerical opinion in the period when Convocation was suppressed, for in this activity it stood alone, though it was not at that time engaged in publishing in the modern sense, but in selecting small pub. books and pamphlets of proved worth and buying up large stocks for distribution to members and for sale to the public and also in acquiring the rights of publication. Among the earliest works thus circulated were Bray's *A Discourse upon the Baptismal Covenant* and the controversial pamphlets of George Keith, a convert from Quakerism. The society also pub. tracts addressed to particular classes of the pop.: *The Husbandman's Spiritual Companion*, *The Christian Soldier*, *Serious Advice and Warning to Servants*, more especially those of the *Nobility and Gentry*. But its prin. publications were cheap reprints of standard works by Anglican divines—Burnet, Hopkins, Lowth, and others—particularly those bearing upon the prayer-book and catechism, the primary purpose of the society being didactic. To this day the S.P.C.K. is regarded primarily in terms of its publishing dept. for it publishes, over not only its own imprint but that of the Church Historical Society, books of first-rate theological and historical scholarship; it also supplies vernacular prayer books for the church overseas; and it operates fifty bookshops in all parts of the world. But this limited viewpoint ignores much of the society's hist. It was the originator of the charity school movement in the eighteenth, and of the National Society for Promoting Religious Education in the early nineteenth century. It was a pioneer in the foundation of church training colleges at home and overseas. It endows scholarships, studentships, and bursaries in many lands. Under the regis. of the society are the School of Eng. Church Music, the Religious Drama Society, and the Church of England Films Commission. It sponsored missionary work in S. India (taken over by the S.P.C.K. in 1825). Has financed the training of medical missionaries for all the missionary societies of the Church of England; and it has helped to endow oversea bishoprics.

Christian Science, name given by Mrs. Mary Baker Eddy (1821-1910) to a system of metaphysical healing based on the Scriptures, the divine Principle of which Mrs. Eddy declares she discovered in 1866, and later elucidated and gave to the world in the textbook of the C. S. movement, *Science and Health with Key to the Scriptures*. This remarkable vol., which is Mrs. Eddy's prin. work, was first pub. in 1875. *Science and Health* is said so to illuminate the Scriptures as to enable those who understand it to repeat in a degree at least the healing and regenerating works of the prophets and of Jesus and the apostles. C. S. accepts the first chapter and the first five verses of the second chapter of Genesis as representing the true account of creation, the account beginning at the sixth verse of the second chapter being regarded as untrue. C. S. accepts Christ Jesus as the Saviour of

the world from sin, sickness, and death, and the Way-shower to eternal life. It distinguishes between Jesus of Nazareth, the son of Mary, and the Christ, the spiritual Son of God. In her *Message to The Mother Church* for 1901, Mrs. Eddy wrote: 'The Christ was Jesus' spiritual selfhood; therefore Christ existed prior to Jesus, who said, "Before Abraham was, I am."' Jesus, the only immaculate, was born of a virgin mother, and Christian Science explains that mystic saying of the Master as to his dual personality, or the spiritual and material Christ Jesus, called in Scripture the Son of God and the Son of man—explains it as referring to his eternal spiritual selfhood and his temporal manhood. In the first chapter of Genesis it is declared that man is made in the image and likeness of God. Christ Jesus' statement, "that which is born of the Spirit is spirit" (John iii. 6) conforms to this. The world in general, however, has accepted the second or false account of the creation of man from the dust of the ground. Christian Science claims to teach men how to overcome the false sense and replace it with the truth which Christ Jesus said would make men free. C. S. declares that God is Spirit, that He is good, and that He is the only creator. This being the case, only the spiritual and the good are real and eternal. The spiritual and good being all, there is in reality no place for evil, sin, disease, and death. Therefore the latter have only a supposititious existence. C. S. does not deny that evil seems real, but maintains that this seeming disappears in the proportion that the truth, which destroys error, is apprehended. The application and effect of this exact, spiritual thinking C. S. declares to be that which Jesus meant when He said, 'Ye shall know the truth, and the truth shall make you free.' C. S. healing, according to its adherents, is brought about by the operation of Truth in human consciousness and not, as some believe, by mental suggestion, psychotherapy, or other form of human will-power.

The first C. S. church was organised in Boston, Massachusetts in 1879. From this beginning, C. S. has circled the globe with a chain of churches numbering over 3000 branch churches and societies as well as 99 univ. organisations. C. S. organisations may now be found in every country of the civilised world. At the head of these is The Mother Church in Boston, of which Mrs. Eddy was the first pastor, and in later years the pastor emeritus. All C. S. churches are branches of this Mother Church, officially known as The First Church of Christ, Scientist. The affairs of The Mother Church are administered by a board of directors of five members. The duty of the directors is to administer the affairs of the denomination under the by-laws framed by Mrs. Eddy. This authority is vested in them by section 8 of Article 1 of the Church Manual as follows: 'The business of The Mother Church shall be transacted by its Christian Science Board of Directors.' No adequate

estimate of the number of Christian Scientists in the world to-day is obtainable, but in 1936 there were 2113 churches and 269,000 communicants in the U.S.A., and to-day The First Church of Christ, Scientist, in Boston, claims to have 333 branch churches and societies in Great Britain and Ireland. There are over 8000 practitioners throughout the world who give their entire time to C. S. healing. Many remarkable cures have been attributed by its adherents to C. S. who claim that these cures have included diseases and deformities considered by the medical profession to be incurable.

The pubs. of the movement issued by the C. S. Publishing Society, Boston, Massachusetts, include periodicals in various languages besides *The Christian Science Monitor* (daily). See Sybil Wilbur, *The Life of Mary Baker Eddy*, 1907; L. Powell, *Mary Baker Eddy: A Life-size Portrait*, 1930; I. Tomlinson, *Twelve Years with Mary Baker Eddy*, 1945; C. Smith, *Historical Sketches from the Life of Mary Baker Eddy and the History of Christian Science*, 1st series, 1934, 2nd series, 1936, and *The Story of Christian Science War-time Activities 1939-1946*, 1947; books by Mary Baker Eddy (q.v.); and H. A. L. Fisher, *Our New Religion*, 1929, containing a bibliography.

Christiania. See OSLO.

Christianity. The whole system of C. may be regarded as having its foundation in the doctrine of the Existence of one God. (See THEISM.) Next to this may be placed the doctrines of the Fall of Man. Man is represented as involved in misery by sin (q.v.)—original and actual—and every individual of the human race as incapacitated for the service and fellowship of God, obnoxious to the displeasure of God, and liable to punishment in a future and eternal state of being. And here we may regard the doctrine of the Atonement (q.v.) as next claiming our attention—a doctrine taught in all the sacrifices (see SACRIFICE) of the patriarchal and Jewish dispensations, as well as by the words of inspired teachers. Man being utterly incapable of effecting his own deliverance from sin and misery, God sent His Son to save sinners, to deliver them from hell, to make them holy, and partakers of the eternal joy and glory of heaven.

By those who regard Christ as merely human, *atonement* or *reconciliation* with God is made to depend on the repentance of man as its immediate cause, whilst the life and death of Christ are represented as merely an example to us of obedience, virtue, and piety in the most trying circumstances; the doctrines of a propitiatory sacrifice, a substitutionary obedience, and an imputed righteousness, with all that form part of the same system falling completely and even necessarily to the ground. These doctrines, however, are all consistently maintained in connection with the doctrine of the Trinity and the generally received doctrine as to the person of Christ. The very incarnation of the Son of God is regarded as a glorious display of the divine condescen-

sion, and a wonderful exaltation of human nature: whilst a personal enjoyment of the highest dignity and bliss of which humanity is capable in the favour and fellowship of God for ever, is to be attained by faith in Jesus Christ.

The indissoluble connection between faith and salvation arises from the divine appointment, but secures a moral harmony, as it provides for bringing into operation—in accordance with the intellectual and moral nature of man—of most powerful and excellent motives for all that is morally good, the partakers of salvation being thus fitted for the fellowship of Him into whose favour they are received; and as it prevents the possibility of any of them taking to themselves, or giving to others, the glory of that salvation, which they really owe to Christ, and which they must therefore ascribe to Christ, as God is a God of truth, and truth must reign in the kingdom of heaven.

Salvation is ascribed by all Christians to the grace of God. The mission of Christ was an act of supreme grace; and all must be ascribed to grace for which we are indebted to Christ. The doctrine of grace is a part of the system of C. on which important differences subsist. But by Christians generally, the personal relation of the believer to Christ, and his faith in Christ, are ascribed to the Holy Ghost or Spirit of God, the third person of the God-head, and so to the grace of God.

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Christiansborg, former Danish fort and settlement on the Gold Coast near Accra (q.v.). It was ceded to Great Britain by the Danes in 1840. The fort is the official residence of the governor of the Gold Coast.

Christiansfeld, tn. in Jutland, Denmark, Pop. 770.

Christiansted, cap. of the formerly Dan. W. Indian Is. of St. Croix which was sold to the U.S.A. in 1917. Pop. 6000.

Christiansund, seaport on W. coast of Norway.

Christie, Alexander (1807-60), Scottish painter. He was b. in Edinburgh, and studied painting under Sir Wm. Allan. He was made director of the ornamental dept. of the school of Art in 1845, and an associate of the Royal Academy in 1848. His best-known picture is 'An Incident

in the History of the Great Plague,' and he also illustrated the Abbotsford ed. of Scott's *Bride of Lammermoor*.

Christie, James Elder (1847-1914), artist of the Glasgow school. He was b. in Fife, Scotland, and studied at the Paisley Art School and also at the Royal Academy. In 1874 he journeyed to London, and in 1877 won a gold medal at the Royal Academy for historical painting. His best-known pictures are 'Pied Piper of Hamelin' (1881), 'Blind Grannie' (1886), 'The Four Maries' (1889), 'Hallowe'en' (1892), 'Bonnie Kilmeny' (1900), and 'Cupid's Bower' (1904).

Christie, James, the Elder (1730-1803), auctioneer of London. Dec. 5, 1766, is the date of his first sale, and the exhibitions of the Royal Academy used to be held on his premises in Pall Mall until 1779. He subsequently moved next door to Gainsborough at Schomberg House.

Christie, James, the Younger (1773-1831), auctioneer and antiquary. He carried on the business of his father, and moved to 8 King Street, St. James's Square, London, in 1824. Present (post-war) premises are at Spencer House, St. James's Place, St. James's Street, S.W.1. The full title of the firm is now Christie, Manson, & Woods Ltd. (see CHRISTIE'S). C. wrote sev. works, among which are: *An Inquiry into the Antient Greek Game* (i.e. chess) (1801), *Etruscan Vases* (1806), and *Greek Vases* (1825).

Christie, Samuel Hunter (1784-1865) Eng. mathematician. He was the son of James C. the Elder, and was b. in London. He took his B.A. degree at Cambridge in 1805, and was second wrangler. In 1806 he was made third mathematical assistant at Woolwich Military Academy, and in 1838 became prof. of mathematics. He wrote many articles for the Royal Society on the effects of temp. and the solar rays on the magnetic needle, and also on the conductivity of certain metals.

Christie's, world-famed art auction room in London. The full title of the firm, founded by James Christie (1730-1803), is Christie, Manson, & Woods, of Spencer House, Stratford Place, St. James's, London, W.1. The most celebrated sale that ever took place there was that of the Hamilton Palace collection in 1882. It lasted for seventeen days, and the amount of money realised was £397,562. All along the hist. of this house there has been a succession of interesting sales. There was the Bernal collection in 1855, with a result of £70,954; the Bicknell pictures in 1863, with £58,639; the Manley Hall collection, 1875-78, with £150,000; the Fountaine collection of 1884 with £96,200. In 1892 the Dudley collection of ninety-one pictures realised £99,564. Also in 1892 there was the Magniac collection of works of art which brought in £103,040. Sir Julian Goldsmid's pictures, furniture, and china in 1896 resulted in £101,727. Sir John Pender's pictures sold in 1897 brought in £81,913; Sir T. G. Carmichael's works of art in 1902 realised £49,273; and the Huth collection of pictures in 1905 realised £50,452. At the Byth sale of innumerable engravings in

1901, a 'first state' of the 'Duchess of Rutland,' by Valentine Green after Sir Joshua Reynolds, realised 1000 guineas. The duke of Cambridge's pictures, jewels, etc., realised £89,734 in 1904; the Orrock collection of pictures the same year fetched £65,946; and Lord Tweedmouth's collection in June 1905 brought in £49,548. In May 1905, 15,000 guineas was paid for a reputed 16th-century *bibron* in rock crystal. The value of Turner pictures much increased in later years, as in 1906 his 'Rape of Europa,' realised 6400 guineas, while in 1909 his 'Mortlake Terrace' realised 12,600 guineas. The jewels of Mrs. Lewis Hill were sold in 1907, and fetched nearly £95,000, while 1650 guineas was paid for Sir Luke Fildes's 'Venetian Flower Girl' in her collection. This was for some years the largest price paid in modern times for a picture by a living artist—though this figure was considerably less than the £4567 10s. paid for W. P. Frith's 'Dinner Party' at Boswell's Lodgings, sold during the life of that artist many years ago. In 1926, however, Orpen's portrait of President Wilson was sold for 2730 guineas. In considering the records of prices realised at C.'s sales after the First World War, the depreciated purchasing power of the pound must be borne in mind. During the war art sales were naturally restricted, but a twelve-day sale by this firm in 1915 of objects of art realised over £37,000 for the Red Cross Society. The year following the war, 1919, was a boom year in art sales, and C.'s sales exceeded £3,000,000. This was in part due to the postponing of sales during the war, and in part to the 'new poor' selling to the *nouveaux riches*. This high figure has not since been exceeded, but in 1929 the money realised by the sale of pictures and drawings alone was the highest in C.'s annals. The largest amount received for one day's sale was on Nov. 6, 1919, when a second collection from Hamilton Palace was sold (see above). This fetched nearly £169,000, thus exceeding the record sale of £150,000 for two days made earlier in the same year, the Drummond collection being disposed of on that occasion. One of the highest bids made for a single picture at C.'s was that made in Nov. 1919 for Romney's portrait of the Beckford children, which formed part of the Hamilton Palace collection: this realised £54,600, and it was then the highest price for a picture sold in the public market; 52,000 guineas was the sum bid earlier in the same year for Sir Joshua Reynolds's 'Mrs. Siddons as the Tragic Muse.' At this figure the picture was bought in, and it was disposed of privately in 1921, going with Gainsborough's 'Blue Boy' to an Amer. purchaser for £200,000. In 1926 a portrait of the family of Sir Wm. Bromley-Davenport realised £60,900 at C.'s. One of the most interesting sales at C.'s in recent years for an *objet d'art* other than a picture was the offering for sale in 1929 of the Portland Vase, which for a hundred years had been lent by the dukes of Portland to

the Brit. Museum. The £34,450 bid was the highest bid of that season, but the vase was bought in at that figure and returned to the museum. The auction rooms of C.'s in St. James's were totally destroyed through enemy action in April 1941, and the firm moved later to Derby House. Good sales went on throughout the Second World War, though no sensational prices were realised. A pair of *capricci* by Canaletto fetched 480 guineas (1942). Lawrence's portrait of 'Miss Juliana Copley' was sold for £4200 in 1943. J. Pierpont Morgan's collection from his

her minority the chancellor, Axel Oxenstjerna, directed the regency and instructed her in politics. Johannes Matthiae educated her more as a boy than a girl, and every one held the highest opinions of her understanding and courage. In 1644 she assumed the sceptre, and impressed every one with her cleverness and good sense. Unfortunately she allowed her pride to rule her judgment and showed herself capricious and reckless. Her treatment of the chancellor was unpardonable, and in her efforts to thwart him and his policy she caused considerable harm and



Christie, Manson, & Woods

A SALE AT CHRISTIE'S

The painting which is being auctioned is Constable's 'Stratford Mill on the Stour'

Hertfordshire residence was sold in 1944 and L. W. Neeld's collection about the same time. Constable's 'Vale of Dedham' was bought for £20,000 before the sale by the trustees of the National Gallery of Scotland. In 1945 a large water-colour of 'Vauxhall Gardens' by Rowlandson was sold for £2730; it had been lost sight of since its exhibition at the Royal Academy in 1784, having been bought in the meantime at an antique dealer's in the suburbs for twenty shillings. Constable's 'Stratford Mill on the Stour,' owned by Lord Swaythling, was sold at C.'s in 1946 for £43,050. The story of the house is told at great length in W. Roberts's *Memorials of Christie's* (1897). See also ART, Art Sales.

Christina (1632-89), queen of Sweden, only daughter of Gustavus Adolphus and Maria Eleonora of Brandenburg, b. 1626. Her father died in her sixth year. During

diminished materially the gains that Sweden should have obtained from the Thirty Years' war. She founded a national school of literature, and encouraged science and learning with great energy. She collected men of learning about her, but allowed her admiration of them to become too extravagant; thus at the death of Descartes, the Fr. philosopher, in 1650, she wished him to be buried at the feet of the Swedish kings and to build a magnificent mausoleum to his memory, which, however, was not permitted. She refused to marry, and the persistent importunities of the Senate, who were anxious about the succession to the throne, caused her to escape the difficulty by appointing Charles Gustavus, her cousin, as her successor. In 1654 she was persuaded to abdicate in favour of her cousin. The idea appealed to her imagination, that a queen in the prime of her

life should voluntarily give up her throne, so a great ceremony took place at the castle of Upsala. She retired from Sweden, dressed as a man, and at Innsbruck she adopted the Catholic faith, having always held the Protestant religion in contempt. In 1655 she entered Rome, again dressed as a man, and astonished the people by her extraordinary behaviour. The rest of her life was a series of adventures and scandals. She twice returned to Sweden in the vain hope of being received as queen again. She d. in Rome in 1689, quite poor and neglected. She is accused of ordering the assassination of Monaldeschi, her majordomo, in 1657. Her valuable library of MSS. was presented to the Vatican by Pope Alexander VIII. See lives by F. W. Bain, 1890; J. A. Taylor, 1909.

Christine de Pisan (c. 1363-1430), Fr. poet of It. parentage. She married the secretary of Charles V. of France, her father being his astrologer. On the death of her husband in 1389 she had recourse to writing as a means of support for herself and three children. She refused invitations from Henry IV. of England and Visconti of Milan, who offered her a home at their courts; for she already enjoyed the patronage of Charles VI. and the dukes of Berry and Burgundy. Her *Le Livre des faits et bonnes meurs du sage roi Charles* (1405) gives an interesting contemporary picture of Charles V. and his court, whilst in her *Les trois vertus* (1407) will be found a unique description of the domestic life of the time. In *La Vision* (1405) she tells her own story, and her *La Cité des dames* (1407) contains a valuable series of contemporary portraits. She was versed in the Lat. poets, and assumed the championship of her sex in *Épître au dieu d'amour* (1399), as also in *Dit de la rose* (1402).

Christinehamn, or **Kristinehamn**, commercial tn. on the N.E. shore of Lake Vener, 25 m. E. of Karlstad in Vermeland, Sweden. Pop. 12,000.

Christison, Sir **Robert** (1797-1882), Scottish physician and toxicologist, graduated at Edinburgh and studied toxicology in Paris under the famous Orfila. From 1822 to 1832 he held the chair of medical jurisprudence in Edinburgh, and from 1829, when he pub. his *Treatise on Poisons*, still a standard work, and was appointed medical officer to the Crown, he frequently gave professional evidence in notorious criminal cases. In 1832 he was promoted to the professorship of medicine and therapeutics, and in 1848 became physician to the queen. C. wrote also on the pathology of the kidneys (1839).

Christlieb, **Theodor** (1833-89), Ger. theologian, was a native of Birkenfeld, Württemberg. He gave up his ministry at the Ger. Protestant Church in Islington, London, in order to take charge of a par. in Friedrichshafen by Lake Constance. Finally in 1868 he accepted a professorship at Bonn. *Modern Doubt and Christian Belief* (1868 in the original) is the most widely read of his numerous writings.

Christmas (*Cristes masse*, the mass of Christ), the season in which the birth of Jesus is commemorated, the central point of the celebrations being C. Day, the supposed actual anniversary of the nativity of Christ, which is generally celebrated in Europe on Dec. 25. The beginning of the celebration of C. as a Christian anniversary cannot be exactly dated. Though some references are made to it as flourishing in the time of Telesphorus (A.D. 138-61), these are probably spurious, and the first certain mention of the festival is in the reign of the Emperor Commodus (A.D. 180-92); it is also spoken of in the third century by Clement of Alexandria. Diocletian, learning that a number of Christians were gathered together in a certain building celebrating the anniversary of the founder of their religion, caused the church to be ignited, and all the worshippers perished in the flames. The early Church had no fixed time to celebrate C.; by some branches it was observed in May, by some in Jan., and by others concurrently with Epiphany. It is, however, certain that the time now fixed could not by any possibility have been the period of Jesus' birth, as Dec. is the rainy season in Judea. The choice of this season was probably due to the general recognition that the winter solstice was the turning-point of the year; all things seem to prepare then for a fresh period of life and activity after the winter sleep of death. Such a belief was general among all nations; the one which especially influenced the Christian Church was probably the Rom. festival of the winter solstice, celebrated on Dec. 25 (*dies natalis solis invicti*). The Celtic and Germanic tribes held the season of C. in veneration from the earliest times, and the Norsemen believed that personal evidence could be obtained of the existence and work of their deities at that time, as they were supposed to be present and active on earth from Dec. 25 to Jan. 6. Many other ant. beliefs and customs about this period have been handed down to our times, and have crept into Christian usage. The lighting of the Yule log, a custom once widely prevalent but now fallen into desuetude, is an inheritance from Lithuanic mythological lore. The practice of decorating churches is pagan in its origin, and the mistletoe so widely used for that purpose was the sacred plant of the Druids. The custom of presenting friends with gifts at C. dates back to the time of the ant. Roms. In Scotland, in the fifteenth century, the Yule celebrations lasted from Dec. 18 to Jan. 7. The latter date was termed U-hale Day, and within the period of the celebrations 'Yule Girth' was proclaimed over all the country, and the worst of miscreants enjoyed sanctuary, as no court had the right to punish them. The 'Up-hellya' of the Shetland Isles is a relic of this ant. custom. It was, however, the aim of the Christian Church to ennoble and lift above their heathen associations all the customs that survived from bygone ages, and with this end their noble liturgy was framed, and many dramatic representations of the

birth and early events in the life of Christ were instituted. Hence the so-called manger-songs, C. carols, special dishes for C., etc. During the Middle Ages and later, the various customs which were practised at C. time, and the legends associated therewith, were exceedingly numerous; most of them have now become obsolete, though the writings of Dickens revived the interest in them for a short time. There are sev. distinctive features still associated with C. The C. tree, a young spruce-tree, still survives; some trace its origin to the Rom. saturnalia as indicated by Virgil's supposed allusion in the line 'Oscilla ex alta suspendunt mollia pinu' (*Georgics*, ii. 389); but the general belief is that the first C. tree dates from the time of St. Boniface, the apostle of Germany (b.c. 680), who is said to have substituted for the sacrifices to Odin's sacred oak a fir tree adorned in tribute to the Christ child. It is also said that Luther introduced the C. tree lighted with candles. It was introduced into England from Germany in the reign of Queen Victoria. Father C., or Santa Claus, who is supposed to come down the chimney and place gifts in the children's stockings that are suspended by the fireplace, has a parallel in every European country. He is identified with St. Nicholas (the Amer. name), Robin Goodfellow, Knecht Ruprecht, and the Fr. Bonhomme Noël. St. Nicholas's Day is properly on Dec. 6. C. as a social festival is undoubtedly observed with much less whole-heartedness than formerly. The festivities of the season were formerly kept up uninterruptedly for over a week; now C. Day and Boxing Day only are general holidays. The custom of giving gratuities to servants, etc., at C. is also Rom. in its origin. The Romans named such gifts *strenæ*, and they were called boxes from the fact that boxes were hung up in church at C. time by the priests for offerings to be dropped therein for the poor and needy of the par. These boxes were opened on the day after C. Day and their contents distributed; hence the day was known as boxing day, and by a common metonymy the gifts themselves came to be known as C. boxes. Public servants formerly received C. boxes, but this was discontinued about 1840, and now tradespeople's employees are the only people to solicit such gifts. C. cards, now so universally used, were instituted in 1848, and the industry has grown enormously. Much advance has been made in the production of cards, and some really artistic productions can now be obtained. The Rom. gladiatorial games at seasons of rejoicing have a modern parallel in football matches, which vast multitudes attend at C. time. From a religious point of view great importance is naturally attached to the commemoration of the birth of the founder of the Christian religion. The day is celebrated by special services in the Rom. Catholic Church, and the priest is allowed to celebrate three masses on the same day, the first at midnight, the second at dawn, and the third in the morning. In the Anglican Church,

there is a special service, special psalms are sung, and the Athanasian Creed is recited. Most of the nonconformist bodies also celebrate the day by special services, etc. In Scotland, C. is not kept as a universal special holiday, New Year's Day taking its place; the Presbyterian Church, therefore, has no special services for C. day. Hansel Monday, the first Monday of the New Year, is the equivalent of Boxing Day in Scotland, and in the more northerly parts of England. Consult Brand, *Popular Antiquities*, 1870; A. Tille, *Yule and Christmas*, 1899; W. F. Dawson, *Christmas and its Associations*, 1901; C. C. Polhill, *Christmas in Ritual and Tradition*, 1925; D. B. Wyndham Lewis and G. C. Heseltine, *A Christmas Book*, 1928.

Christmas Island. 1. Is., never more than 12 m. long and 9 m. broad, in the E. part of the Indian Ocean, 190 m. S. of Java. Area 60 sq. m. It is a Brit. possession under the gov. of the Straits Settlements, and now part of the Federation of Malaya. It is the deposits of phosphate of lime, the result of the continuous action of the dung of sea-fowl on the chalk below, which give the is. its one commercial value. It is the top of a submerged mt., some 15,000 ft. high, of which 1200 ft. only rise above the surface of the sea. It was visited by Daupler in 1688 and was annexed in 1889. It was then uninhabited. Pop. about 1300, employees of the Phosphate Company. Most of the houses on the is. have electric light and running water. There are 11 m. of railway and 8 m. of road. A wireless station was installed in 1923. The is. was occupied by the Jap. during the Second World War. 2. Is. (with a 90-m. circuit) in Polynesia, Pacific Ocean, lies a little above the equator, S. of Honolulu. It is attached to the Gilbert and Ellice Is. colony, and lies in 1° 59' N. lat., and 157° 30' W. long., and about 160 m. E.S.E. of Fanning Is. Discovered by Cook in 1777, it was annexed by Great Britain in 1898 with a view to laying the Pacific cable, of which Fanning Is. is a station. Under a licence dated 1914 the Central Pacific Coco-nut Plantations Ltd. has the exclusive right to occupy the island for their own use for the planting of coco-nuts, the manuf. of copra, the export of coco-nut oil, pearl shell, and guano for eighty-seven years. Periodical visits are made by H.M. ships. Area 80,000 ac. (12,000 under coco-nuts). Pop. 50.

Christmas Rose, or *Helleborus niger*, also known as the **Black Hellebore**, is a species of Ranunculaceæ which is a native of Europe and flowers in the winter. The leaves are evergreen, the rhizome is black—hence the second popular name—and the flower has at first a white or reddish-tinged calyx, but this becomes green after fertilisation has taken place. Despite the fact that the plant is ranunculaceous, the flower really bears considerable resemblance to a single rose, for there are five petaloid sepals and the stamens are numerous. Formerly the hellebore was considered to be of medical value in cases of mental derangement, but it is little

used nowadays; it contains a property which renders it an acrid poison. See also HELLEBORR.

Christophe, Henri (1767-1820), Negro king of Haiti. Originally a slave of Grenada, he became a chief under Des-salines, emperor of Haiti. After the latter's murder he estab. himself as king of the N. Civil war followed, but he was declared king in 1812. His cruelty caused a revolt, and to escape imprisonment he shot himself. A bronze plaque on his tomb is inscribed 'Ci-git le Roi Henri Christophe, né le 6 Octobre, 1767, mort le 20 Octobre, 1820, dont la devise fut: Je renais de mes cendres.'

Christopher I., king of Denmark (1252-1259), succeeded his brother, Abel. He was obliged to make over the rich duchy of Schleswig to his nephew, Valdemar, thereby beginning the regrettable dissensions over the Crown lands. When C. imprisoned his primate, Jakob Erlandsen, like a common felon, because of his devotion to the pope and contempt for his own authority, he was excommunicated, but sudden death (probably by poison) put an abrupt end to the dispute.

Christopher II., king of Denmark (1319-1332), made repeated attempts to secure the duchy of S. Jutland (Schleswig), which had fallen to a minor, Valdemar V. But the latter's guardian expelled him finally. However, when C. secured the recognition of Valdemar as heir to the Dan. throne, he received the duchy, after promising that it should never be incorporated with Denmark. During his reign the royal prerogative was considerably curtailed, and the privileges of the aristocratic party strengthened. The virtual dissolution of the kingdom at his death into the Scanian prov., Schleswig, E. Denmark, and Jutland and Funen, clearly demonstrates the weakness of his rule.

Christopher III. (1418-48), king of Norway and Sweden, besides Denmark. C. owed his accession (1439) to the Rigsraad, not to the people. In his reign the peasants were downtrodden, and in Jutland, after their rising of 1441, were reduced almost to the condition of serfdom.

Christopher (1515-68), Duke of Württemberg, son of Duke Ulrich I., who d. 1550 when C. succeeded him. He completed the work of his father by converting his subjects to the reformed Protestant faith and establishing the Lutheran Church. He introduced a system of church government, part of which still endures. He was a recognised protector of the Protestants throughout the religious wars of the period.

Christopher, St. (d. A.D. 250), patron of ferrymen, was a great preacher of Syria, who converted, it is said, 48,000 people to Christianity, before he himself was finally martyred, after excruciating torture, during the persecutions of A.D. 250. His world-wide renown is due to legend rather than to fact. The representation of him in art with the infant Christ upon his shoulder is founded on a beautiful story, of which the following is a bare epitome. A little child once asked C.,

who was of imposing stature, to carry him over a bridgeless stream. Staggering across, the bearer cried out against the strange heaviness of his load, but the boy replied: 'Marvel not, for with me hast thou borne the sins of the whole world.'

Christopoulos, Athanasios (1772-1847), Gk. poet, studied at Buda and Padua, and from 1811 assisted Prince Caradja, hospodar of Moldavia and Wallachia, in making a code of laws for his country. When Caradja fell he lived in retirement and composed his lyrics and drinking songs which earned him a wide popularity. Besides translating Homer and Herodotus into modern Gk., he wrote *Politika Parallala*, on different forms of gov., a tragedy, and some philological works.

Christ's College, college of Cambridge Univ., England, founded in 1505 by Lady Margaret Beaufort, mother of Henry VII. On the site of C. C., previous to 1505, had stood 'God's House,' founded in 1439 (or 1436) by Wm. Byngham, rector of St. John Zachary in the city of London, under the supervision of Clare Hall. There is little record of the friends who helped Byngham, but it is said that one of them was John Brockley, master of the Drapers' Company in 1442. Henry VI. gave the new foundation his royal charter on April 16, 1448. It was only a small college or hall, and was intended for the training of schoolmasters and has been described as the first secondary training college in England. Byngham, who became the first proctor or master of God's House, d. in 1456. For some years after this time the revenues of God's House languished, and by the beginning of the sixteenth century it maintained only four scholars, besides the proctor. It was then revived as C. C. by Lady Margaret Beaufort, who declared herself to be heir to all King Henry's godly intentions, and her endowment provided for a much larger foundation—for the maintenance of a master, twelve fellows, and forty-seven scholars. In the letters patent of Henry VII., dated May 1, 1505, Henry is recognised as founder of this new but continuing college. Part of the building was refaced in the seventeenth century. The fellows' building in the second court was partially built by Inigo Jones, and is a fine example of Palladian style. The garden is especially beautiful, having suffered least of all the college gardens during rebuilding or enlarging. The rooms once occupied by the foundress have been preserved with very little alteration. John Milton was a scholar here, and a mulberry-tree said to have been planted by him still lives and bears fruit. Among C. C.'s famous alumni are Bishop Latimer, John Leland, the antiquary, and Charles Darwin. The college is closely connected by exhibitions with schools of N. England. In 1948 F. M. Smuts, the most distinguished living member of the college, was installed as chancellor.

Christ's Hospital (the Blue-coat School) was founded in 1553 by Edward VI. The original buildings were those of the monastery of the Grey Friars in Newgate

Street, London. King Edward VI. gave a grant of money, and various charitable persons assisted, and it became richly endowed. It was at first devoted to orphans, and in 1553 was providing home and education for 400 children. The mayor and citizens of London were nominated governors in its charter. Thomas Guy, the founder of Guy's Hospital, endowed the school with £400 a year. In 1677 'parish children and foundlings' were excluded, and only children of the freemen of the city were admitted. Sev. new regulations have been added from time to time, and children presented by governors are admitted to the foundation, also sons of naval officers. The dress of the boys has scarcely differed in style since 1553; they wear a long blue coat and knee-breeches with yellow stockings and white neckbands, the only difference being that the yellow petticoat and flat blue cap have been discarded, and no covering for the head is worn. From time to time alterations were made in the buildings; in 1692 Sir Christopher Wren built the S. front, which is now destroyed. In 1902, the school was removed to new buildings at Horsham in Sussex, which were designed by Sir Aston Webb; the building is on an entirely new plan for public schools, accommodating over 800 boarders (there are now no day scholars). The old buildings were destroyed, except a portion incorporated in the enlargement of St. Bartholomew's Hospital. The boys still retain the auct. name of Grecians and deputy Grecians for the two highest classes. The main school is divided into the Lat. school and the mathematical school, corresponding to the usual classical and modern sides. There are many univ. scholarships and exhibitions, and large sums are spent annually in apprenticeship for both boys and girls. Many distinguished men have been pupils at C. H.; among these were Camden, Stillingfleet, Charles Lamb, S. T. Coleridge, and Leigh Hunt. The girls' school, also originally in Newgate Street, was removed in 1798 to Hertford, and now takes 280 boarders (no day scholars). Lamb's essay on C. H. gives a picture of the school in its old days.

Christ's Thorn, or *Palurus aculeatus*, species of Rhamnaceæ which flourishes in S. Europe and in W. Asia. The shrub is common in Palestine, and is said to have provided the crown of Christ; the thorns are formed from the stipules. The name is applied for a similar reason to other plants, especially to *Zizyphus Spina-Christi*, another species of the same order with stipular thorns, related to plants which produce the fruit known as the jubebe.

Christy, Henry (1810-65). Eng. ethnologist, was a director of the London Joint-Stock Bank, but from 1851, when his interest in ethnological questions was stimulated at the Great Exhibition, he gave his whole life to travel and research. From 1853 till his death he explored the caves in the valley of the Vézère in S. France, trying to deduce from the flint

implements, etc., he found the antiquity of man in Europe. He pub. the results of his investigations, and at his death bequeathed to the nation his unique archaeological collection, made in Scandinavia, Denmark, Brit. Columbia, and Mexico, besides in France. The *Guide* to this collection was pub. in 1868.

Chromatic Scale, in music, a series of semitones written with sharps ascending and flats descending, not involving a change of key, and arranged with accidentals.

Chromatic Thermometer, apparatus for measuring temp. by observing the colour of the light radiated from a heated body. A heated body changes in colour from red to white as its temp. rises, and a comparison of the colour with a standard that gives an indication of the temp.

Chromatography, or **Adsorption Analysis**, method of analysing mixtures of chemical compounds by their differential adsorption on a solid adsorbing medium through which they are passed in solution. The process was originally invented by the Polish botanist Tswett in 1906, but it is only within the last few years that its possibilities have been realised. The solution to be analysed is allowed to seep down through the finely divided adsorbing solid, such as magnesia, alumina, gypsum, or calcium carbonate, contained in a vertical glass tube. The ingredients in the mixture are thus withdrawn from the solution, but at different levels, and if they are coloured a series of zones or bands is seen. The column with its absorbed coloured compounds is called a chromatogram. It is pushed out of the glass tube and cut up into its various coloured zones. The compound in each zone is then washed out with a suitable solvent, which is afterwards evaporated, so leaving the coloured compound itself. In this way, separation of the mixture into its ingredients is effected. Though originally applicable to the analysis of coloured substances only, the method has recently been extended by the use of ultra-violet light, in which many compounds colourless in ordinary light appear brightly coloured. C. is extremely useful in biochemistry, e.g. the study of vitamins and plant pigments, and also has industrial applications. See T. I. Williams, *An Introduction to Chromatography*, 1946.

Chromatophores, pigmented cells in the surface of plants and animals, whose function appears to be restricted to the production of colour for appearance's sake. They are developed out of young cells which may become *leucoplasts* or starch-formers, *chloroplasts*, or chlorophyll cells with nutritive functions, or may be specialised to the production of pigment only.

Chromatype, a photograph on paper sensitised by salts of chromium.

Chrome Yellow (**Lead Chromate**, $PbCrO_4$), colouring material used in dyeing and as a pigment. It is found as a mineral in Siberia, in the Urals, Brazil, and the Philippines, under the name of crocoisite. It may be prepared by precipitating a solution of a lead salt with

potassium dichromate. Different shades may be obtained by mixing with lead sulphate, which gives a lighter shade, or with C. red, which gives numerous shades of C. orange.

Chromic Acid (H_2CrO_4) is important because of its salts, the chromates. It is liberated on adding to a concentrated solution of potassium anhydrochromate a sufficient excess of sulphuric acid. The acid, when the solution is concentrated, loses water and deposits deep red crystals of C. anhydride or chromium trioxide. The excess of sulphuric acid and potassium sulphate is washed out with nitric acid, which is then driven off by gentle heat. C. A. has never been isolated in the pure state. With sulphuric acid, C. A. acts as a powerful oxidising agent, and as such is much used in organic chem., while in botany it is used for dissolving intercellular tissue. The acid is used for dyeing in red and brown colours. C. A., however, is not so important as the chromates. In their production the native chrome iron ore, $Fe(CrO_4)_2$, is used. This is heated in the powder form with lime and potassium carbonate in a reverberatory furnace, where oxidation takes place and potassium and calcium chromates are formed together with ferric oxide. This is treated with water, and the chromates are thus extracted. For the production of the bichromate of potash, or, more properly, potassium dichromate ($K_2Cr_2O_7$), which is used as a pigment, the solution of chromates is treated with sulphuric acid, and the potassium sulphate formed produces, by means of double decomposition, the potassium chromate and precipitates calcium sulphate. To convert the chromate into dichromate, a certain quantity of sulphuric acid is added to the solution. The bichromate forms large red prisms, and in solution gives a very poisonous acid solution.

Chromite, mineral which forms the chief source of chromium and its compounds. It consists of chromium, iron, and oxygen, $FeO Cr_2O_3$, and is known as chrome iron ore, chromic iron, and chrome iron stone. It forms octahedral crystals, but is usually found in granular masses; its hardness is 5½, sp. gr. 4.5, and it is black or dark-brown in colour. It is found in ultra-basic igneous rocks, and is mined in California, New Zealand, Turkey, the Urals, and in the Shetland Is.

Chromium (symbol Cr; atomic weight 52.01), hard steel-grey metal belonging to the same chemical group as molybdenum, tungsten, and uranium. It is not found free in nature, but in chrome iron ore ($Cr_2O_3 \cdot FeO$), crocoisite, and chrome ochre it is found very frequently. Many green stones, such as emerald and serpentine, owe their colour to its presence. The general methods of production are the reduction of the oxide by carbon in the electric furnace or its replacement by aluminium. Its chief industrial uses are in C. plating and in the addition of very small quantities to steel, which it renders hard and tenacious. The important salts are the chromates.

Chromosome, body—generally one of sev. similar bodies—formed from the chromatin network of a cell-nucleus during the process of normal cell-div. (karyokinesis or mitosis). The C. is supposed to be the carrier of hereditary factors. See CELL; GENETICS, HEREDITY.

Chromosphere, name given to the shell of luminous gas which surrounds the photosphere of the sun. When observed in its usual condition by the eye or the telescope, the sun is seen as a highly luminous disk with a sharp edge: this is called the photosphere. When, however, the eye cannot see the bright photosphere, as in an eclipse of the sun, its great luminosity does not mask the lesser luminosity of the C., which can then be clearly seen or photographed. The edge of the C. is, however, not regular, for there shoot out from it gigantic flame-like masses of luminous material called prominences, which testify to the greatly agitated state of the sun's surroundings. With only the telescope, eye, and camera not much more information can be gained with regard to this peculiar atmosphere, but from the kinetic theory of gases we might deduce that the great temp. of the sun would give the molecules of its gaseous constituents enormous velocities which would enable them to go a long way from the sun before they were brought back by the gravitational force. The most fruitful method of study, however, is by means of the spectroscope, which has been applied to the purpose very successfully by Lockyer, Hale, Deslandres, and others. By its means the C. was seen to be composed of many elements in the gaseous states, particularly hydrogen, helium, and calcium, a line spectrum being observed in place of the continuous spectrum of the sun. It has been possible to photograph any portion of the C. and the prominences issuing from it, and it has been found that the prominences are associated with the sun-spots, or faculae, which reach the edge of the sun's disk, so that they are often the accompaniment of violent eruptions in the interior portion of the sun.

Chronicle (Gk. *χρονος*, time) denotes a hist. in which facts are recorded according to the sequence of time. The oldest C. in Eng. literature is the A.-S. C., part of which is, in fact, 'the oldest historical prose in any Teutonic language.' The C. exists in seven different MSS., which are generally designated by the first seven letters of the alphabet. It is probable that the C. in part represents the work of King Alfred, and that much of it was written under his superintendence. The A or Parker MS. is the best authority for the earlier periods. The work of chronicling contemporary hist. was probably carried out by monks. Winchester, then the most important place in Wessex, being at first the centre from which the work was done. The events of Alfred's reign are written in a spirited style but the account of events towards the end of the tenth century, when the work of chronicling was moved to Canterbury, is meagre. The A MS. carries the hist. down to the year 1071. The B MS. is fragmentary

and a transcript of A. The C MS. was written in (or from) Abingdon, and extended to the Conquest, B extending only to 977, and differing very little from C. The E. or Laud MS. is of great interest. It was written probably in Peterborough and is full of patriotic spirit. It is the latest of all the versions, the last entries dating from 1154. In it is to be found the celebrated passage describing the sufferings of the country from the self-seeking, avaricious barons of Stephen's reign. For the most part the C. is bare and scrappy, the briefest notices being given of deaths, coronations, the founding of monasteries, and the like. There are, however, some passages, such as that relating to the tragic death of King Cynewulf in 755, which are written in a vivid, graphic style, and, occasionally, pieces of verse are inserted, of which the poem celebrating the battle of Brunanburh is pre-eminently the finest. The C. was printed as early as 1643, and has since been frequently reprinted and trans. The most important eds. are *Two of the Saxon Chronicles Parallel* (1865), ed., with an introduction, by Prof. Earle; re-ed., with appendices and glossary, by Charles Plummer (1892, 1899); *The Anglo-Saxon Chronicle*, ed. with a translation, by Benjamin Thorpe (2 vols.) (1861). (Consult *The Cambridge History of English Literature*, vol. i., 1907.) Other Cs. of interest to the student of Eng. literature may be briefly noticed. The *New Chronicles of England and France*, by Robert Fabyan (d. 1513), was pub. in 1516, and relates the hist. of England from the arrival of Brutus to the battle of Bosworth (1485). The standard ed. is that of Sir Henry Ellis (1811). Raphael Holinshed's *Chronicle*, pub. in two folio vols. in 1578, is of supreme importance from the fact that Shakespeare owed to it so much of his material for most of his historical plays, as well as for one or two others, such as *Cymbeline* and *King Lear*. John Stow (1525-1605) assisted in the continuation of Holinshed's C., and himself wrote a *Summary of English Chronicles* (1561). Sir Richard Baker's *Chronicle of the Kings of England* was written in Fleet Prison, and was pub. in 1643. Two books of the O.T. are called Cs., and are dealt with in the next article.

Chronicles, the First and Second Books of the. The Heb. name, *Divrat hayyamim*, signifies events of the days, whereas the Gk. of the Septuagint, *Παραλειπόμενα*, means things passed over. These two books of the O.T. form one book in the Heb. canon, and constitute a hist. of the Jewish people from the time of Adam up to the return from captivity. Some of the events recorded in the Second Book of Samuel and the Books of Kings are here repeated, and the narrative is continued in the books of Ezra and Nehemiah. Nothing is known of the authorship of C., except what can be deduced from internal evidence. It was written by someone who had Levitical leanings, and who apparently, from the language and syntax he used, lived about 330 B.C., or even later. It was therefore written at a time when prophecy had become extinct, and when

every Heb. was chiefly interested in Jerusalem, the hist. of the Temple, and all things that pertained to the theocracy of Zion. The early part of the hist. is contracted into the form of genealogies (1 Chron. i.-ix.). There are numerous omissions in the records of the reigns of David and Solomon (1 Chron. x.-2, Chron. ix.), only those things being mentioned which serve to prove God's goodness to those who obey the divine law. Accordingly, the sin of David, the revolt of Absalom, the idolatry of Solomon, etc., are omitted, as they do not serve the purpose of the author. Many details are given as to divine feasts, and offerings and services in the Temple, which are not mentioned elsewhere. The author refers sev. times to the 'Book of the Kings of Israel and Judah,' to a *midrash* or commentary of the Book of Kings, and to the words of the prophet Jehu, and the vision of Isaiah. Modern scholars do not regard very highly the historical value of C. The most useful commentaries are those by Bertheau and Benzinger. See S. R. Driver, *An Introduction to the Literature of the Old Testament*, 1891, and Dr. Curtis in the *International Critical Commentary*, 1910.

Chrono-chrome. One of the earliest systems of colour cinematography introduced by M. Gaumont in 1912. When first shown to the public at the Gaumont Theatre, Paris, the system was received with enthusiasm owing to the naturalness and delicacy of the colours obtained, but it did not develop commercially, and is now entirely superseded. C. was produced by taking three pictures simultaneously through red, green, and blue-violet screens, and then projecting the three pictures through similarly coloured screens. All shades of red, violet, and blue, and even a perfect white, were portrayed—colours which had proved almost impossible to reproduce hitherto. They were poetically described as 'pictures from the palette of the sun.'

Chronograms (from Gk. χρόνος, time, and γραμμα, a letter) were extravagant devices in fashion during the late Rom. Empire and afterwards in the Renaissance period, whereby the date was indicated by certain letters in the inscription, written large to stand out. The reader had to rearrange the outstanding letters so as to form the date. Thus ChristVs DVX; ergo triVMphVs was stamped on a coin struck by Gustavus Adolphus in 1632 MDCCVVVVII.).

Chronograph, instrument by which the length of a period of time is recorded. Strictly speaking, there should be a distinction between the meanings of the words chronoscope and C. The former should apply to instruments which allow the extent of passage of time to be seen by reference to a dial or other indicator, while a C. should possess an apparatus for making permanent records of certain desired periods. A stop-watch is therefore a chronoscope, and a watch or clock provided with a stylus capable of tracing lines proportionate in length to the corresponding periods of time would become a

C. Cs. are usually constructed to indicate very short periods with great accuracy, and for this purpose the ordinary clock mechanism is unsuitable, as any error within the period of its escapement can be introduced. Cs. of various forms are used for astronomical purposes, for estimating high velocities, for measuring certain physiological phenomena, and even for determining the finish of a horse-race. The essential parts of a C. are a pendulum or other mechanism for indicating solar time, a stylus or recorder which can be applied promptly at the beginning of the period and released at the end, and a moving surface on which the record is made. Instead of a pendulum or clock, actual time may be indicated by the vibration of a tuning-fork, to one of the prongs of which a light stylus is fixed. When the period of the tuning-fork's vibrations has been ascertained by comparison with mean solar time, it is possible to indicate small fractions of a second by the number of vibrations in a period. The moving surface is generally cylindrical in form, and smooth enough to offer little resistance to the stylus. The surface is graduated by lines at right angles to the direction of its motion, and it is obvious that the greater its velocity the more graduations will be covered in a given period and the more accurate it will be to ascertain small fractions. The stylus is in most cases applied and released by breaking or establishing an electrical circuit. In the Bashforth C. for determining the velocity of shot, there are two recorders: one is controlled by an electromagnet in circuit with a clock, the other forms a circuit with a series of screens placed at known distances apart. When the shot passes through a screen, it displaces a weight which breaks the circuit, which is then almost immediately automatically re-established through the second screen; it is again broken by the shot, again re-established, and so on to the end of the series. The length of a second as indicated by the one recorder is represented by 18 in. and the interruptions in the other record, therefore, lead to an accurate determination of the time spent by the shot in traversing the distances between the screens. Cs. are also used to indicate the period of transit of a star, to estimate the velocity of sound, and to measure accurately certain muscular movements, when the stylus may be moved by the muscle itself. For physiological uses of Cs. see E. H. Starling, *Principles of Human Physiology*, 1926.

Chronology (Gk. χρόνος and λόγος, discourse, account), science of computing and adjusting time, or periods of time, in order to ascertain the true historical sequence of past events and their exact dates. C. differs from hist. in that it recounts events purely with regard to their order in time and without taking into account their relation to each other. Time has from the beginning been measured astronomically, according to the revolutions of the sun and moon and to recurring celestial phenomena. The natural divs. of time are the day and

night, a larger div. being the lunar month. Barbaric races have generally reckoned their time by means of lunar months, without thought of dating events from a fixed epoch. The early civilised races, however, regulated their time from a fixed epoch, each choosing a great event in its national hist. from which to date all other events, both prior and subsequent to it. The epoch universally adopted in modern times is the birth of Christ, the years before it being marked B.C., and those after it A.D. (Anno Domini). This method of dating events was first practised by Dionysius Exiguus about A.D. 533. The first era made use of by the Gks. was that of the Olympiads. The Olympic Games were held every four years, so that an Olympiad was reckoned as a period of four years. The epoch from which the Gks. reckoned time was the victory of Coræbus in the first Olympic Games, held in Elis, and calculated to have taken place in the year 776 B.C. The Gk. historian Timæus, who lived in the reign of Ptolemæus Philadelphus (283-245 B.C.), was the first to reckon by means of Olympiads, and his method was followed by other Gk. historians. The Nabonassar era owes its name to the founder of the Babylonian kingdom, and is said to have been used from the time of its origin, Feb. 26, 747 B.C. This era was adopted by Hipparchus and Ptolemy, and was used by astronomers because its calculations were based on celestial phenomena. The Rom. era dated from the foundation of the city of Rome, which is generally accepted, from the computation of Terentius Varro, as 753 B.C. Verrius Flaccus, however, placed it a year later, whereas M. Porcius Cato gave it as 754 B.C., Polybius as 750 B.C., and Fabius Pictor as 747 B.C. The years were denoted by the letters A.U.C. *anno urbis conditæ*, 'in the year of the founding of the city.' Another common method of reckoning among Lat. historians was by the ann. consulships. Not infrequently both the year of the city and the names of the consuls are given. The dates according to various eras can easily be transferred to each other or to the Christian era by arithmetical calculation. For example, to change from the Rom. to the Christian era, if the date is before the birth of Christ the years of Rome should be subtracted from 754; if the date is after the birth of Christ, 754 should be subtracted from the years of Rome. Other eras of note are the era of Constantinople, dated from the supposed creation of the world, 5508 years and four months before the beginning of the Dionysian or Christian era; the era of Alexandria, placing the creation of man Aug. 29, 5502 B.C.; the era of Alexander, counted from the date of his death, Sept. 1, 323 B.C.; the era of the Seleucids, also known as that of the Macedonian era, beginning Sept. 1, 312 B.C., and commemorating the capture of Babylon by Seleucus Nicator; the Julian era, at the time of Cæsar's reformation of the calendar; and the era of Spain, dating from the conquest of Spain by the Romans, 38 B.C. The Gk. and Rom. methods of reckoning continued long after

the birth of Christ. From A.D. 312, however, the general mode of computation throughout the Rom. Empire was by a system known as Indictions, which were cycles or periods of fifteen years, beginning with the year 312. Indictions were of three kinds: The Indiction of Constantinople, beginning Sept. 1, A.D. 312; the Imperial Indiction, beginning Sept. 24, A.D. 312; and the Pontifical or Rom. Indiction, beginning Dec. 25, A.D. 312 or Jan. 1, A.D. 313. The method of reckoning from the birth of Christ was first invented, as has been mentioned above, about A.D. 533.

The Dionysian year began on March 23, from the Annunciation. If the date of man's creation on this earth could possibly have been estab., that would form the most convenient point from which to start the reckoning of time and to date the events of hist. The great objection to the use of the Dionysian or Christian era, is, of course, that it is divided into two parts, which necessarily involves a certain amount of confusion in reckoning. Furthermore, as the year immediately preceding the birth of Christ is called 1 B.C., and the year immediately following it A.D. 1, the birth itself has to be fixed at 0. Joseph Justus Scaliger tried to obviate these difficulties in 1582 by his invention of what is known as the Julian period. His period began 4713 B.C., so that the year 4714 of the Julian period corresponded to A.D. 1. He also estimated 7980 years in a Julian period. According to the Septuagint version of the Bible, the creation of the world took place 6000 years before the birth of Christ, and 2250 years before the flood. The Heb. version reckons 4000 years from the creation to the birth of Christ, and 1656 from the creation to the flood. The Samaritan version, however, allows for an interval of only 1307 years between the creation and the flood. According to the modern interpretation, by scientists and theologians alike, of the first few chapters of Genesis, the creation of the world cannot be fixed with any definiteness whatever, and must have taken place at a far earlier period than any suggested above. The chief eras that date after the birth of Christ are the Diocletian, or era of martyrs, A.D. 284 (still in use among the Copts and Abyssinians); the Mohammedan era, dating from the flight of the prophet from Mecca and Medina, July 16, A.D. 622, and the Persian or Gelat-ed-din era, dating from the accession of Yezdegird, A.D. 632. The chief eras may be tabulated thus:

	B.C.
Era of Constantinople	Sept. 1, 5508
Era of Alexandria	Aug. 29, 5502
Era of Antioch	Aug. 29, 5492
Julian period	Jan. 1, 4713
Jewish Mundane era	Oct. 1, 3761
Olympiads	July 1, 776
Era of Rome	April 24, 753
Era of Nabonassar	Feb. 26, 747
Era of Alexander	Sept. 1, 323
Era of the Seleucidæ	Sept. 1, 312
Julian year	Jan. 1, 45
Era of Spain	Jan. 1, 38

A.D.

Era of Diocletian	Sept. 1, 284
Era of Mohammed	July 16, 622
Era of Persia	June 16, 632

The year began on different days in different places. When Julius Cæsar reformed the calendar in 45 B.C., Jan. 1 was fixed on as the beginning of the year. This was used in England as the first day of the year from the time of the Conquest till 1155. After that date, March 25 was regarded as the beginning of a year in conformity with the continental custom. In 1582 Pope Gregory XIII. reformed the calendar, and introduced what is known as the New Style. During the sixteenth and early seventeenth centuries, the New Style, with Jan. 1 as New Year's Day, was adopted by most of the European powers, including Italy, France, Germany, Spain, and Portugal. England, with Russia and Sweden, adhered to the Old Style until 1751, when Lord Chesterfield took the matter up and tried to rouse interest by his contributions to the *World*. 'It was not,' he said, 'very honourable for England to remain in a gross and avowed error, especially in such company.' The Eng. calendar was, by comparison with the continental, eleven days out, and Chesterfield, in collaboration with Lord Macclesfield, the mathematician, and Bradley, the astronomer, drew up a scheme and passed the motion through the House at the time of the Pelham ministry. The year 1752 was to begin on Jan. 1 instead of March 25, and in order to rectify the error in the Old Style, the day following Sept. 2 was to be called Sept. 14. The reformation of the calendar met with much ignorant opposition on the part of the public. The scheme was regarded as a wicked concession to Rome, and the popular Opposition: election, cry was 'Give us back our eleven days.' Consult Scaliger, *De Emendatione Temporum*, 1582; Sir I. Newton, *Chronology Amended*, 1728; C. L. Ideler, *Lehrbuch*, 1831; Sir H. Nicolas, *Chronology of History*, 1833; Woodward and Cates, *Encyclopædia of Chronology*, 1872; J. C. Macdonald, *Chronologies and Calendars*, 1897, etc.

Chronometer, see **HOROLOGY**.

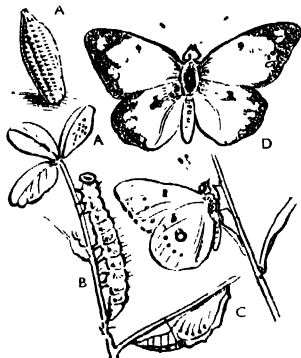
Chronometer, in music, see **METRONOME**.

Chronoscope, instrument which indicates the length of a short period of time. The term is applied to an apparatus for measuring the period of certain luminous phenomena of which the eye can be no accurate judge, on account of the persistence of a sensation in the retina. It consists of a rapidly moving mirror, which, owing to its motion along the circumference of a circle, reflects a flash as a luminous arc; the length of the arc thus indicates the duration of the flash. Sir Andrew Noble invented a C. which might more accurately be called a chronograph. A series of plugs is arranged so as to project inside the bore of a gun, each forming part of the primary circuit of an induction coil. The circuit is broken in each case by the passage of the shot, and the spark passing between the terminals of the secondary produces a spot on the

edge of a rapidly rotating disk which is coated with lamp-black. There is a disk to each plug, so that the positions of the spots enable the velocity of the shot to be ascertained. See CHRONOGRAPH.

Chrudim, tn. of Czechoslovakia, 62 m. S.E. of Prague, situated on the Chrudimka. It is noted for its horse markets, and has manufs. of cloth and sugar. Pop. 13,000.

Chrysalis, or **Chrysalid**, term applied to the pupa of an insect; but especially to that of a butterfly or moth. It is essentially the resting stage of the



STAGES IN THE LIFE OF THE BUTTERFLY
A egg (magnified); B, caterpillar; C, (chrysalis); D, butterfly

creature's life, when, the larva having stored up much food, the perfect insect is built up from the disintegrated tissues. The pupa may be exposed or within a cocoon.

Chrysanthemum (Gk. χρυσός, gold, ἄνθος, flower), genus of Compositae, contains about 150 species of varied and beautiful plants which are natives of all countries but Australia, and are generally hardy in Britain. The plants are either herbaceous or shrubby in habit, and the flower-heads consist exclusively of ligulate florets of almost every colour except blue. Pure white, bright yellow, deep and pale red, rich purple, and dark brown occur in different varieties, and contribute to the beauty for which the species are admired. The order is popularly known from its comprehending the species *C. sinense* and *C. indicum*, and natives of China and Japan, from which our autumn varieties are derived. In cultivation the different varieties require a good, rich, well-manured soil, and they should be carefully protected from frost. In Britain we have sev. common species. *C. segetum*, the corn marigold, is an annual with yellow flowers, and occurs as a weed in fields; *C. Leucanthemum*, the ox-eye or dog-daisy, is a well-known meadow plant with white ray florets and yellow disk-florets; *C. frutescens*, the Paris daisy or marguerite of France, is grown as a

garden plant and somewhat resembles *C. Leucanthemum*: *C. Parthenium*, the feverfew, has small flower-heads, and is used as a remedy for slight fevers; *C. carinatum*, the tricolor daisy, comes from Barbary, and is an annual cultivated in Britain, *C. arcticum* is a small species with pink and white florets. In this country hardy perennial Cs. include the hardy border as well as the early and late flowering Jap. (greenhouse) kinds, both single and double flowered in white, and practically every colour and shade excepting blue. They flower from Aug. to Christmas (indoors), from Aug. to mid Dec. (hardy border) outdoors. Hardy annual types (*C. carinatum*) or summer-flowering marguerite, will flower from seed sown in a very sheltered border, or in a cold frame the previous autumn, or in a greenhouse. They have both single and double (*C. coronarium*) flowers in many colours, and white. There is a growing tendency to sustain the stock of perennial Cs. from seeds sown in heat in February to flower the following autumn, so as to obviate the trouble of growing on from cuttings year by year in greenhouses.

Chrysanthemum, Order of the (Kikkwa Daijasho), was instituted in 1877 by the Emperor Musto Hiti of Japan, and is conferred on members of the royal house and on foreign princes. The badge is conventional in design, with a red sun in the centre, sending forth white and gold rays, separated into four groups by a yellow C. with green leaves, the whole hanging from a larger yellow C.

Chryseis, daughter of the Gk. priest, Chryses, Achilles, by his rape of C., had called down the wrath of Apollo, who sent a dreadful pestilence in token of his displeasure. When Calchas, the seer, revealed the cause of the god's anger, Achilles, on the demand of Agamemnon, the king, was obliged to restore C. to her father, but insisted on receiving Agamemnon's slave, Briseis, in compensation. Homer in his *Iliad* tells the disastrous sequel to the strife which thus arose between the two champions of the Gks.

Chryselephantine (Gk. χρυσός and ἰλφας, ivory), adjective used to describe the gold and ivory statues of the Gks., by far the most famous of which were the colossal Zeus at Olympia and Athena in the Parthenon of Phidias. A development from wooden images where flesh was painted white and drapery gilded, these C. statues were built up on wooden or clay cores, by attaching thin plates of ivory (to represent flesh tints) and gold. The preciousness of the materials amply accounts for the non-survival of any illustration of this art.

Chrysididae, family of insects, in the series Hymenoptera Tubulifera, consists of near allies of the true wasp which are called popularly ruby-wasp or golden-tailed flies. They are brightly coloured creatures with wings moving so swiftly as to make them invisible, and in habit they are parasitic in the nests of bees and wasps. *Chrysis ignita* is a common Brit. species. The adult wasp lays her eggs

in the nest of other species, and the larva feeds upon the young insect which it has supplanted. The Chrysis is a brilliantly coloured and very active creature.

Chrysippus (c. 280–206 B.C.), Gk. philosopher, and one of the leaders of the Stoic school of philosophy, b. at Soli in Cilicia. He came to Athens and studied under Cleanthes. His skill in argument and his impartiality and reasonableness earned him the name of the Column of the Portico (Stoa). He saved the doctrines of the Stoics from extinction. He wrote 750 treatises, of which only fragments survive; some of them are preserved in the MSS. found at Herculaneum. See N. L. Davidson, *The Stoic Creed*, 1907; E. Bréhaut, *Chrysippe*, 1910.

Chrysobalanus, one of the sub-orders of the natural order Rosaceæ, formerly considered to be a distinct natural order. Warming, however, has classed it as a sub-order of Rosaceæ, a position it now usually holds. The sub-order contains the typical genera *Hirtella* and *Chrysobalanus*. The species are tropical trees and shrubs, often bearing the name of plum. *C. Icacó*, the coco plum, is a native of the W. Indies, where the fruit is considered to be a delicacy.

Chrysoberyl, crystallised mineral, generally of a green colour, translucent, and having a vitreous lustre and conchoidal fracture. Sp. gr., 3.8; hardness, 8.5. It consists of alumina, 77.0 per cent; glucina, 17.5 per cent; protoxide of iron, 5.0 per cent; other matters, 0.5 per cent. A few specimens are met with uncrystallised. It is found mostly in Ceylon and Brazil. When the green is very pale it is often called oriental chrysolite. It crystallises into six-sided crystals.

Chrysocloridæ, family of insectivorous mammals containing a single genus with about half a dozen species known as Cape golden moles. The Chrysoclore has mole-like habits, and its eyes are covered with skin, but it has only four digits on its fore-paws, while the mole has five. It has no tail, and the ears lack pinnae. *C. capensis*, the Cape chrysoclore, has a velvety fur of metallic lustre, burrows underground, and feeds on worms and insects.

Chrysocolia, ore of copper, being the hydrated silicate of that metal. It is of a bluish colour, and found in large quantities in the Mississippi valley and in smaller quantities in Cornwall and Cumberland.

Chrysocoma, genus of composite plants, is indigenous to S. Africa. *C. linocyrus* is rarely found in limestone cliffs of Britain; it is fleshy with yellow flowers.

Chrysolite (golden stone), mineral of pale greenish colour, crystallising in rectangular prisms. It is a silicate of magnesia and protoxide of iron, the formula being $2(\text{MgFe})\text{O} \cdot \text{SiO}_2$. It is mostly used in jewellery, and is occasionally found in rounded masses, but usually as a constituent of basalt and lavas. The common form of the mineral is olivine, which is of an olive green or brownish colour. The crystals are positively doubly refractive.

Chrysoloras, Manuel, or Emmanuel (c. 1355–1415), one of the chief introducers of Gk. literature and learning to W. Europe, b. at Constantinople; he studied under the philosopher Gemistus, and was sent in 1383 by the Emperor Manuel Palæologus to Italy to beg for help against the Turks. On his return he was invited by Florence to reside in the city and teach Gk. Here he lived for three years, travelling much in Italy, his translation of Plato and Homer becoming famous. He went on an embassy to Germany in 1413 to fix on the place where the approaching general council of the Church was to meet, and he represented the Gk. Church in the train of John XXIII. at Constance, where he d. suddenly. His printed works are two only: *Erotemata*, a Gk. grammar, and *Epistole de comparatione veteris et novæ Romæ*.

Chrysomelidæ, large family of coleopterous insects, consists of smallish and brilliantly coloured species. The fat little grubs and the perfect beetle are both vegetarian in diet, and many are destructive to crops. The well-known Colorado beetle (*q.v.*) is a species which feeds on potatoes.

Chrysophrys, genus of the Sparidæ or sea breams, contains acanthopterygious fish which inhabit warm and tropical seas. *C. aurata*, the gilt-head, is an hermaphrodite species which has been found off our coast, but usually frequents the Mediterranean.

Chrysophyllum Cainito, or Star-apple, is a species of Sapotaceæ which grows in the W. Indies and is valued on account of its edible fruit. The plant is a moderately sized spreading tree, and the fruit abounds in a sweet milky juice which flows copiously when it is beginning to mature. The flowers grow in small purplish bunches. When cut across the seeds present a stellate figure, whence the name.

Chrysosplenium, genus of Saxifragaceæ, occurs in mild countries, its species being herbaceous plants with pale green flowers. *C. alternifolium* and *C. oppositifolium* are natives of Britain, and are called golden saxifragos.

Chrysoprase, mineral variety of chalcopy used as a precious stone, more particularly on the Continent. Its prin. constituents are crystalline and amorphous silica which are combined to give differential effects; but the fine apple-green colour is given by the presence of nickel oxide.

Chrysops, genus of Tabanidæ, contains sev. species of flies known by the name of cleg or gad-fly, and noted for their large and beautiful green-gold eyes. Three species occur in Britain, they are all bloodsuckers, and are very troublesome to cattle and horses in summer. The gad-fly (*Tabanus bovinus*) is nearly 1 in. long. See also CLEG; HORSE FLY. *C. excrucians* and *C. relidus* have an unenviable notoriety.

Chrysorrhæas, see JOANNES DAMASCENUS, St.

Chrysostom (Gk. *Χρυσόστομος*, the golden-mouthed), St. John Chrysostom (c. 346–

407), one of the great fathers of the Christian Church, also known as John of Antioch, *b.* at Antioch. He attended the school of the sophist Libanius, and showed such remarkable powers of mind that he would have succeeded his teacher as the head of the school had not the influence of his mother and many Christian friends persuaded him to be baptised, about A.D. 370. For ten years he lived in the desert, studying theology, but his austerities led to a severe illness, and he returned to Antioch, where he was ordained. After another ten years' strenuous work in Antioch he was made archbishop of Constantinople, and became one of the most famous preachers of the age. His knowledge of human nature was keen and deep, and his eloquence made him as many enemies as adherents. His sermons in St. Sophia were directed not only against the Arians but even more against the licentiousness of the imperial court and the idleness and vice of the innumerable monks who thronged the city. The Arians at this time had no place of worship and met at night outside public buildings, where they sang hymns expounding their doctrines. To counteract their influence on the orthodox, C. arranged a system of nightly processional hymn singing, the first example of hymns combined with a service. Riots ensued and much bloodshed, the Empress Eudoxia's chief eunuch being slain. In order to condemn C., Theophilus, bishop of Alexandria, summoned a synod which met at Chalcedon through fear of the fury of the people of Constantinople, who were the ardent supporters of their archbishop. He refused to appear, was condemned on the charge of Origenism and contumacy, and was removed to Nicæa in Bithynia. The fury of the populace was so aroused that he was hastily brought back to Constantinople, but two months later he was once more exiled, this time to Cucusus in Cilicia. From here he wrote many of his greatest sermons and letters, and planned missions to the Persians and Goths. His vindictive enemies then secured his removal to the far desert of Pityus, and on his way there he d. Fresh riots broke out in Constantinople at the news of his death, and peace was not finally restored until his bones were brought back thirty years afterwards. His festival in the Gk. Church is on Nov. 13, in the Lat. Church Jan. 27. The prayer of St. C., that stands last but one at the end of matins, evensong, and the litany in the Eng. Book of Common Prayer, is taken from the liturgy of St. C. His works are voluminous, and nearly all have been preserved. See *Oxford Library of the Fathers*; and *Lives* by W. R. W. Stephens, 1872; H. W. Bush, 1885; and A. Pouch, 1891. See also Palladius, *Dialogus de vita S. Chrysostomi* (ed. by P. R. Coleman-Norton), 1928; *Divine Liturgy* (trans. by E. E. Brightman), 1931.

Chrysostomus, see **DION CHRYSOSTOMUS**.
Chrysothrix, genus of squirrel monkeys, belongs to the family Cebidae (q.v.). It consists of four species, all of which are

arboreal, insectivorous, and gregarious; the long tail is non-prehensile and the face is small.

Chrzanow, tn., 25 m. W. by N. of Cracow, in Poland. Pop. (1939) 12,000.

Chu, a riv. some 570 m. in length, in the Kirghiz S.S.R. of Soviet Central Asia. Rising in the Tianshan Mts., in the W.S.W. of Lake Issyk Kul, it is first known as the Koshkar. Passing within 3 m. of Issyk Kul, it swerves into the gorge of Buam, and leaving Tokmak behind flows on towards Lake Saumulkul, disappearing in the desert 125 m. before reaching it. Its valley supports one-third of the total pop. of the republic, and its water has in recent years been used for irrigation works, bringing 200,000 ac. of formerly arid land under cultivation. The valley produces grain and cotton, and is noted for horse-breeding.

Chüanohow (Chinchew), ant. port and walled city in the prov. of Fukien, China. There being now a great sand-bar across the harbour mouth, C. has been outstripped in trade by the port Amoy. The most famous bridge in the whole of China connects C. with its suburb, Loyang. Marco Polo and other travellers mention C. as carrying on a large traffic with Europe in the Middle Ages.

Chub, name of sev. carp-like fishes, in the large family Cyprinidae, is applied in Britain to *Leuciscus cephalus*. In N. America, however, it is given to the near ally, *Leucosomus corporalis*, and to fishes of the genus *Ceraticthys*.

Chubb, Charles (d. 1845), locksmith, improved the detector lock, which his brother had originally patented in 1818. After managing a hardware business with 200 hands in Wolverhampton, he went to London, where he set up a factory for burglar- and fire-proof safes of his own patent in 1835.

Chubb, Thomas (1679-1746), Eng. deist, *b.* at E. Harnham, near Salisbury, the son of a maltster. Apprenticed to a tallow chandler, he educated himself on the death of his father in 1688, theology being his favourite subject. In 1715 he wrote *The Supremacy of the Father*, followed by sev. other theological works. C. is interesting as representing a popular form of deism, and as showing the hold that rationalism had taken on the popular mind. His works also include *The Supremacy of the Father asserted* (1715); *A Discourse concerning Reason* (1711); and *The True Gospel of Jesus Christ* (1739).

Chubut, ter. in S. Argentina, bounded on the N. by Río Negro, on the E. by the Atlantic, on the S. by Santa Cruz, and on the W. by Chile. Connected by rail with Puerto Madryn on the Bahía Nueva. Rising in the Andes, the R. C. flows straight across to the Atlantic. The Senguerr discharges into Lake Colhuapi, other lakes of size being La Plata and Fontana in the Andean highlands, and Musters in the interior. Save for the fertile, forested valleys on the Andean border the whole country is an arid pebble-strewn waste, clothed with stunted vegetation. Nevertheless, there is a Welsh colony near the C. mouth, with Rawson as its cap. and

Madryn (44 m. distant) as its chief port. Total area, 93,427 sq. m. Pop. 28,000 (of whom 18,000 are at Rawson).

Chuching, or **Klutsing**, well-fortified city, 78½ m. E.N.E. of Kunming, in the prov. of Yunnan, S. China.

Chudleigh, tn. in Devonshire, England, 8 m. S.W. of Exeter. In 1807 it was almost destroyed by fire, but was rebuilt. It is noted for cider. Pop. 2000.

Chudleigh, or **Chidley**, promontory on the N. coast at the entrance of Hudson Straits in Labrador, Canada.

Chudskoye, Lake, see **PEIPUS**.

Chufut-Kaleh, deserted tn. 2½ m. E. of Bakhiserai in the Crimea region of the R.S.F.S.R. Perched on precipitous and wellnigh inaccessible cliffs, 1835 ft. above sea level, it was in the fifteenth century the refuge of the Karaites Jews from the Crimea. Between C. and Bakhiserai is the Uspenskiy monastery, clinging like a limpet to the cliff face.

Chuguyev, tn. on the r. b. of the N. Donetz, 24½ m. E.S.E. of Kharkov, in the Ukraine S.S.R. Pop. 16,000.

Chuhsung, or **Tsuyung**, tn. 77 m. W. of Kunming, in Yunnan, China.

Chukchi, people dwelling in scattered groups along the Arctic shores between the Bering Straits and Kolyma R. in the Chukhot National region of the R.S.F.S.R. Nordenskiöld, who first studied this curious tribe during his expedition of 1878-79, came to the conclusion that their language resembled Koryak, not Eskimo, and sums up his discussion of their racial characteristics by saying that they bear 'an unmistakable stamp of the Mongols of Asia and the Eskimo and Indians of America.' The C., who are divided into the poor Fishing C., with fixed homes, and the comparatively well-to-do and nomadic Reindeer C., who breed great herds of reindeer and live on their milk and flesh, are tall and lean, with thick lips, coarse lank black hair, and puffy cheeks which often completely wrap in the nose.

Chukiang, see **CANTON RIVER**.

Chulmleigh, mkt. tn. 2 m. from Eggesford station and 14 m. S.E. of Barnstaple in Devonshire, England. Pop. 1143

Chumba, see **CHAMBA**.

Chumbi Valley, natural approach to Tibet from India, up which the Brit. expedition to Lhasa in 1904 advanced. Flanked by Bhutan and Sikkim, it lies on the S. slopes of the Himalayas at an elevation of 9500 ft.

Chumbul, or **Chambal**, unnavigable riv. (314 m. long) of central India, rising in Málwá, near Mau, and joining the Jumna, W. of Cawnpore.

Chunam, Indian name for quicklime, made from very pure limestone or from calcined shells. It is used as an ingredient for plaster, when it is well mixed into a paste, together with fine riv. sand and jaggery (coarse sugar).

Chunar, see **CHANAR**.

Chunchos, The savage people who dwell in communal houses and live by hunting in the forests E. of Cuzco, central Peru. They are an independent tribe of S. Amer. Indians, not unlike the Antis. But the

term C. has also been referred to one of the three aboriginal peoples of Peru.

Chunchuses, warlike tribe of marauders, dwelling in certain parts of Manchuria and Mongolia. In the Russo-Jap. war, the Jap. were suspected of bribing these freebooters to wreck the railroads. They disown the suzerainty of China.

Chungking, commercial cap. of the prov. of Szechwan and of the whole of W. China. As a result of the Jap. invasion of China during the Second World War C. became the Chinese cap. of Chiang Kai-shek's Gov. and the centre of Chinese resistance to both the Jap. invasion troops and the Chinese Communists. It occupies the end of a high rocky bluff at the junction of the R. Kialing with the Yangtze, and is surrounded by a stone wall in good repair. Before the war with Japan it had many fine shops and streets. Its pre-war exports were yellow silk, wax, hides, wool, hemp, feathers, etc., and Chinese medicines, but even before the Jap. invasion trade had been crippled by brigandage in the interior. In the Second World War (and even before) C. was repeatedly bombed by Jap. aeroplanes, but its natural defences and shelters guaranteed its immunity from destruction. In May 1943 five Jap. divs. pushed up the Yangtze valley with the object of forcing a passage through the mt. gorges which formed the gateway to the city, which was the centre and the symbol of resistance to Jap. aggression. The tide was turned largely by allied air power despite the smallness of the available forces. Heavy bombers struck at the Jap. base of Ichang, disrupting communications (May 29), and next day a Chinese counter-offensive was launched which threw the Jap. force back in disorder; and by June the threat to C. had been removed. With the walled city of Kiangpohting now incorporated in C. and the large vils. near, C. is estimated to contain a pop. (1944) of about 880,000.

Chunian, tn. in the Lahore dist., W. Punjab, Pakistan, 45 m. S.S.W. of Lahore. Pop. 10,300.

Chupanga, or **Shupanga**, vil. of Portuguese E. Africa, on the r. b. of Lower Zambezi R. The scenery is beautiful, but the dist. malarial. The wife of Livingstone, the explorer and missionary, was buried here (1862).

Chupra, see **CHAPRA**.

Chuquicamata, tn. in the prov. of Antofagasta in the N. highlands of Chile. Since 1910 it has been an important mining and coal centre. There are especially rich copper mines. Pop. 15,000.

Chuquisaca, or **Chareao**, dept. in Bolivia lying between the Andes and the Paraguay R., forming the S.E. corner. The cap. tn. is Sucre. It covers an area of 26,400 sq. m. Pop. 370,000.

Chuquisaca, or **Sucre**, cap. of Bolivia, S. America. See **SUCRE**.

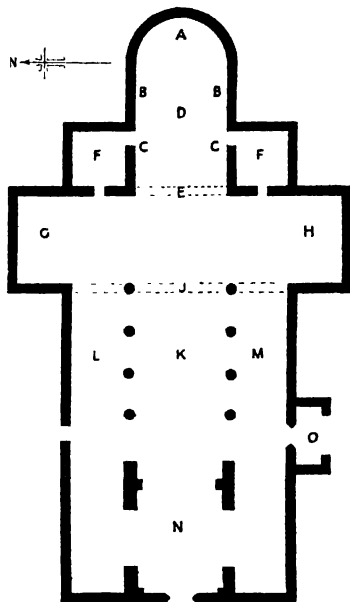
Chuquito, **Chuquito**, or **Chuquyto**, prov. of Peru, also cap. of this prov., 12 m. from Puno, on W. of Lake Titicaca. There are silver and gold mines, woollen manufs., dyeing of vicuña wool. Prehistoric remains have been found in the dist. Pop. 5000.

Chur, see COIRE.

Chura, feudatory state of Kathiawar, Gujarat, India; also cap. of same, 56 m. from Cambay. Pop. 5500.

Church, derived from the Gk. word *κυριακόν* (*δαίμα*), meaning the Lord's House, from *κυριός*, lord, or master. Other forms of the word are seen in the Swedish *kirka* the Ger. *Kirche*, the A.-S. *circe*, and the Scottish *kirk*. Its original meaning, therefore, was limited to the place of assembly and worship, but, like numberless other words of common usage, which have been adopted from a classical into modern European tongues, its sense has expanded with the development of new thoughts and customs. Thus C. may be applied also to a Christian sect, to the clergy, or to the whole community of Christian people, and it is interesting to notice the word *ecclesia* (from Gk. *ἐκκλησία*, assembly) has undergone an exactly contrary transformation, being now applied to the building rather than to the body of Christians (cf. Welsh *eglwys* and Fr. *église*). Inasmuch as the structure of the place of public worship or C. is indissolubly bound up with the development of ritual, dogma, and organisation, it has been thought well to preface this article with a brief sketch of the hist. of C. architecture. It was in the fourth century that Christianity was officially adopted as the religion of the Rom. Empire, and it was natural that C. architects should seek inspiration from some existing architectural type. This they found in the basilica (*q.v.*), which must therefore be regarded as the basis of all C. architecture. The magistrates were accustomed to sit in the apse of the basilica, separated by the *cancelli* (the bar or lattice) from the litigants and common people, who stood facing them in a long atrium or open court at the W. In the embryo C. the officiating priests occupied the apse in the E., and sat with their backs to the wall in the presbytery, looking towards the congregation gathered in the court, now called the nave. The *cancelli* exercised an incalculable influence in completely cutting off the clergy from the laity and so augmenting the dignity of their sacerdotal functions. In the E. this lattice developed into a screen of sacred paintings which effectually hid from the laity the supreme act of the holy eucharist. The bema or choir, which was simply an enclosure between the presbytery and the nave, arose from the need of greater accommodation for clergy and singers, and later was further augmented where it was necessary to seat a large body of monks. The chancel—that is the choir and the sanctuary, which was the portion of the apse especially railed off for the priests—was divided from the nave by a structural arch, a screen, or steps, and sometimes by all three. The two pulpits or ambons on either side of the choir, from which the gospels and epistles were read to the assembled worshippers, may still be seen in the basilica C. of San Clemente in

Rome. There is some doubt as to the exact origin of the cruciform Cs., although the popular belief that they were always meant to be symbolical of the cross of crucifixion assuredly accounts for their speedy adoption in medieval Cs., for in the Middle Ages the love of symbolism amounted to a passion. In the E. the popularity of the dome led to the erection of Cs. in the shape of a Gk. cross with one central and four smaller domes



TYPICAL PLAN OF A CRUCIFORM CHURCH

A, apse; B, presbytery; C, choir; D, chancel; E, chancel arch; F, sacristy or vestry; G, north transept; H, south transept; J, the crossing; K, nave; L, north aisle; M, south aisle; N, tower; and O, porch.

over the arms of the cross. It is easy to see how desire to accentuate the cruciform figure and faith in the efficacy of the altar sacrifice together tended to the extension of the N. and S. arms, which grew into the transepts of the great Gothic cathedrals, for these side aisles offered a splendid opportunity for subsidiary chapels and altars where masses might be said. It early became the custom to build the chief of these chapels, that dedicated to the Blessed Virgin, and known as the Lady chapel, behind the high altar in the E., and the increased love of ritual and pageant induced architects to continue the nave and chancel aisles between the high altar and the Lady chapel, so as to form ambulatories—an arrangement which contributed much to the dignity and

picturesque scope of processions. Though the circular form was almost invariably confined to the apse in the chancel, the Knights Templars usually built their Cs. round, in imitation of that of the Holy Sepulchre in Jerusalem. But the Reformation and the later spread of nonconformity and puritanism altered C. architecture and decoration so as to suit the needs of what men now conceived to be the ideal form of service and worship. The medieval builders had made their cathedrals a magnificent embodiment of that somewhat materialised literal Christianity, the highest expression of which is found in Dante, and had therefore embellished the walls with great paintings representing scenes from the O.T. and N.T. and episodes in the lives of the saints, had set everywhere sculptural figures of the Virgin, the apostles, the saints, and Christ, and had freely depicted in pictures the terrors of hell and the majesty of heaven, whilst outside they delighted in carving hideous gargoyles to typify the expulsion of all demons from the house of God. Moreover, the wealthy religious houses had vied with one another in erecting spacious and splendid edifices to the greater glory of God, with small regard to the needs of the congregation or the neighbourhood of tns. But with the rise of Protestantism, a mighty iconoclastic wave swept over Europe, and cathedrals and Cs. were ruthlessly stripped of all their adornment save their stained glass. In truth the substitution of the Bible for the mass was almost the death-blow of C. architecture as a fine art. The Renaissance had already led to a disastrous imitation of anct. and especially of Gk. models, and now 'the new religion' was responsible for the growth of Cs. of the so-called conventicle type. In these the auditorium where the congregation sits is merely a great hall with a gallery running round three sides, whilst on a dais at the E. end is set the pulpit from which the minister addresses his people without being separated from them otherwise than by his platform. Cs. are designated metropolitan, cathedral, conventual, collegiate, and par., according to their status, size, and importance, but difference in name does not imply a difference in structure. In modern times Cs. are frequently built in imitation of Romanesque, and especially of Gothic models.

Church Discipline (*Disciplina ecclesiastica*) is the means by which the Christian C. deals with any of its officials and members, who, by serious immorality or other dishonour, have fallen completely away from the Christian standard of living and visibly and palpably stained the purity of a common spiritual life. In the days of the apostolic fathers the practice, which St. Paul had encouraged in his Cs., held good—that is, the local ecclesia were entirely responsible for the behaviour of its members. The accepted doctrine was that if any man will not listen to the C. when it expresses on any moral issue the teaching of Jesus Christ, he is *ipso facto* self-excommunicate,

having rejected the final and supreme court of appeal. When, however, Christianity was finally and openly adopted into the great Rom. Empire, the C. ceased to consist of separate and independent societies of 'saints,' and these latter were obliged to sacrifice their anct. prerogatives one by one, including discipline, and to pass gradually into a state of spiritual pupillage to that great unifying body whose highest representative the pope was soon to be. During the period of persecutions under Decius, the alarming increase of apostasy led to stringent rules for the restoration of the lapsed rules which were not superseded till the end of the fourth century.

Up to the seventh century the (to us) extraordinary custom of public penance was in force. The enrolment of sinners into the rank of penitents took place during Lent. Penitential canons regulated the time during which the sinner must remain in the sev. grades of weepers, hearers, prostraters, and standers, whilst their readmission within the pale of the C. usually occurred in Holy Week. As regards the treatment of the *lapsi*, various opinions obtained among the different sects. The Novatians believed that forgiveness of those who had fallen away from faith rested only with God, whilst the Montanists insisted that a sinner once under the ban of his C. must remain *in statu penitentis* for the remainder of his life. The dreadful humiliation of public penance accounts for its disappearance by the eleventh century. Before that date it had become hopelessly abused. For letters of recommendation (*libelli pacis*) often secured the restoration of penitents, and the vicious system of commuting penance for taxes appeared as early as 550. The Celtic monks were responsible for the compilation of lengthy Penitentials.

But the most effectual of the weapons of the medieval C. were excommunication and the interdict. The greater excommunication deprives the individual of all civil and social intercourse besides all the ordinances of religion. Lesser excommunications do not involve exclusion from communion and fellowship other than religious. The interdict involved only the suspension of religious services in a church or dist., not exclusion from the Church. It was inflicted therefore on places instead of on persons. Calvin, who, unlike Zwingli, was opposed to the surrender of all eccles. power to the state, advocated the retention of the *discipline de l'excommunication*. It was because Geneva refused to sanction his proposals that Calvin was driven into banishment in 1538. Yet in 1541, on his return, Calvin triumphed, and henceforward a consistory or council of elders was estab. in every par. of the Reformed Church—a chief function being the exercise of disciplinary authority over the congregations. In the seventeenth century, notwithstanding that penance had been formally abolished, evildoers were wont to make satisfaction publicly

on the stool of repentance, and for grave transgressions against eccles. law it was the fashion in Ayrshire, as late as 1781, for the penitent to stand in a public part of the C., dressed in sackcloth, to signify his contrition. The kirk-sessions can still pronounce the lesser excommunication, by which the offender is banned from all sealing ordinances.

Bibliography: A. J. Carlyle, *The Church*, 1902; E. J. C. Neep and G. Edinger, *A Handbook of Church Law for the Clergy*, 1930; K. Macinorran, *A Handbook for Churchwardens and Church Councillors*, 1942.

Church History may conveniently be divided into three epochs, anct., medieval, and modern. (For the development in the *treatment of church hist.*, see CHURCH HISTORY.) The first period reaches from the death of Christ to A.D. 590 or perhaps, in the estimation of some, to the foundation of Charlemagne's empire (800), the reign of Constantine forming a dividing line; the second extends to the Reformation, being divided at the supremacy of the papacy under Innocent III.; and the last may be subdivided by the treaty of Westphalia, which closed the Thirty Years war. The Pentecostal assembly of the apostles (A.D. 33) may be regarded as the seed of the Catholic C. Here the disciples received the fullest conception of their mission as preachers of the Resurrection and the great Messianic gospel of their Master. During his missionary travels from A.D. 40 to 58 Paul began the huge task of evangelising the Gentiles, and he, more than any other, must be revered as the founder of Christian theology. As the Romans only appreciated a state religion, the humble and despised Christian sects of the metropolis and greater Italy were persecuted because they practised a *religio illicita* (an unlawful superstition). The outbreaks of persecution occurred principally under the Emperor Nero (64), Domitian (96) and Trajan, whose famous correspondence with Pliny is well known. It should here be noted that the fall of Jerusalem, about this time (70), must be held an inestimable boon to Christianity, in that it finally freed it from the oppressive fetters of Judaistic legalism. Up to the days of Decius persecution was purely spasmodic and ineffectual, whilst with Hadrian and Antonius Pius the Christians, who were regarded as a negligible factor, enjoyed considerable toleration and protection, being allowed to form themselves into funeral associations and poor men's guilds. But from 250, when the Catholic community, with its hierarchical constitution and systematised worship was held to be a serious menace to the whole military and religious policy of the empire, the emperors instituted universal massacres which continued till the abdication of Diocletian in 305. This last made desperate but futile efforts to exterminate the whole Christian society. At last, with the advent of Constantine in 313, came peace; for Constantine, who himself on his deathbed received the holy

baptism, extended to Christianity all the privileges and rights that hitherto paganism alone had enjoyed. But it was not until the accession of Theodosius the Great (379-95) that Christianity was finally adopted as the one and only religion of the state. Meanwhile, since the early years of the third century the conversion of the heathens in the E.—that is, in Arabia, Persia, and Armenia, and on the N. and W. confines of Rom. rule—had been making continual headway, so that before the great migrations of the fourth century the Goths and Teutonic invaders were already Christian.

In Persia and elsewhere political persecution and later the force of Islam wiped out all traces of Christian proselytes, but in the W. the effect of the barbaric invasions was to endure the Christian bishops with much of that social and moral power formerly wielded by the Rom. officials, so that the C. came naturally to be regarded as the heir to all the majesty and influence of anct. Rome. There emerge in the second century three officials connected with the Christian ecclesie, namely, the bishop, presbyter, and deacon, whose functions at first were patriarchal—that is, they administered charities and punished offenders against C. discipline. In earliest times there was one bishop attached to each C., but if he were away, it is easy to see how natural it was for his duties to devolve on the presbyters, sev. of whom were frequently appointed to each community. Ordinarily, however, the presbyters constituted the bishop's council, and the deacons his assistants merely. But as early as the third century diocesan began to supplant congregational bishops, or, in other words, the principle of centralisation was put into action whereby a number of Cs. were entrusted to the care of one bishop, usually a bishop in a large tn., who alone could ordain, and as whose representatives the presbyters only could conduct worship in the sev. Cs. The emergence of metropolitan bishops and finally of the papacy was a natural outcome of this process of centralisation. By the metropolitan system, the bishops of Ephesus, Carthage, and Arles, etc., exercised authority over many Cs. of neighbouring provs., whilst the bishops of Rome, Constantinople, Antioch, Alexandria, and Jerusalem exercised a still wider jurisdiction, and early became known as the patriarchs.

The mediæval doctrine that the C. was the ultimate authority on all questions, temporal as well as spiritual, received a mighty support from Augustine's *De Civitate Dei*, wherein the author maintained that the unified Christian C. was the kingdom of God, and accordingly was supreme over all nations here on earth. Upon this theory, too, was based the papacy—that is, the supreme authority of the bishop of Rome as Christ's vicar in this world. Christian doctrine, as embodied in the prayer books, took centuries to evolve, yet within a few years of Christ's death men's minds were agitated by questions of faith and belief, and bitter controversies rent asunder

the smallest Christian gatherings. The struggle with Gnosticism in the second century helped immeasurably towards the clearer definition of Christian theology. For an apostolic scriptural canon, our N.T. was drawn up, as also an apostolic rule of faith which forms the germ of the present Apostles' Creed. Above all, the doctrine of apostolic succession was promulgated—that is, that the bishops alone are qualified and inspired to interpret and expound the teaching of the Apostles, of which, indeed, they are the sole inheritors. Montanism (170) was essentially an outcry against the growing institutionalism of the C. It was in connection with this controversy that the first C. synods were held.

The first general or œcumenical council of the whole Christian community was held at Nicæa in 325, and from that time forward it became customary to call such a representative gathering whenever grave doctrinal difficulties arose. These synods and councils have a twofold importance: they were invaluable aids towards the principle of unification, and they laid the foundation stones of Christian orthodoxy. At the Nicæan Council the Godhead of Christ received official definition and official expression in the Nicæne Creed, whilst at the Council of Chalcedon (451) an attempt was made to find an answer to that long-debated problem, 'What is the relation between the divine and human nature of our Lord?' By the decisions of these two councils and that of Constantinople (680) the doctrine of the Trinity, held by both the W. and E. Cs., was explicitly formulated. The broad tendencies noteworthy in the mode of worship during this period are the elaboration of ceremonies and the rapid increase in their importance; the completer severance of the sacerdotal functions from those of the laity and the augmented dignity of the priests. While the E. C. was engaged in thrashing out the Christological and Trinitarian doctrines, the main controversy of a similar nature in the W. was that aroused by Pelagius, who came from Britain, on the nature of grace. A doctrine which was deemed a pillar of early Christian theology, was that the C. was the one ark of salvation, outside of which none could be saved. Thus to attain everlasting salvation a man must undergo baptism to release him from the devil and to generate in him a new spiritual nature, and, further, he must continually increase the divine life in him by feeding his soul on the body and blood of Christ in the holy communion. It is quite impossible within the limits of a short article to outline, even in the simplest form, the conclusions arrived at by the early theologians. The reader is therefore referred to the copious writings of the apostolic fathers, in whose works will be found an explanation of the countless schisms which oppressed the infant C., such, for instance, as the Origen controversy (394–438), the Apollinarian (362–81), and the Nestorian (428–44).

To take up the thread of the course of

the external hist. of the C. at the eighth century—there were at that time two great forces which seemed likely to swamp Christendom, namely, Mohammedanism and the idolatry of the Saxons and other barbaric hordes. But the Gallic conqueror, Charles the Hammer, by his victory at Tours in 732, effectually put a stop to the inroads of the Saracens in the W., whilst a stubborn warfare of thirty-two years (772–804) at last enabled Charles the Great to subjugate the Saxons, their conversion to Christianity being accomplished by the building of tns. and castles and the foundation of missions and monasteries. With the Christian religion once firmly estab., the mediæval hist. of the Catholic C. resolves itself into an account of the rapid consolidation of the papal power and of its lengthy struggle with the Holy Rom. Empire, and, further, into an account of the movements of reform which arose in the C. itself, and also of those wider and more influential strivings after other forms of religion and worship which took firm root in the hearts of men throughout the Christian world.

From 730 eccles. lawyers spread the fable that Constantine had given the guardianship of the Catholic C. and State to the bishop of Rome, but an event which in actual fact contributed far more than this fable to the confirmation of the pope's authority was the final severance in 1054 of the W. from the E. C. The Monophysite (484–519) and other schisms had much to do with this rupture, but its real cause was the refusal of the bishops of Constantinople to submit in any way to the Rom. see. It was, of course, the great monastic orders, such as the Benedictines, Dominicans, and Franciscans, which, in particular, kept burning during the Middle Ages the flame of the lamp of anct. science and culture. From the fourth century onward, monasticism continually gained new ground: men of religious fibre gladly sought solitude or communion with kindred spirits, that in peace they might develop their higher life. The conventual life, indeed, was in part a revolt against contemporary society, with its wars and lusts and manifold corruptions, and it was ever a bulwark of the C. Thus from the monastery of Cluny, founded in 910, there passed out to the world what were known as the Cluniac reforms directed towards the reorganisation and cleansing of eccles. offices, and above all towards emancipation from state control. Yet, in spite of new orders, reformed clergy, and the work of such churchmen as Gerbert, Lanfranc, and Anselm, evils like the marriage of clergy, simony, and the selling of benefices continued. But for a time the papacy triumphed. From 1048 to 1266 Europe was divided by the famous struggle between pope and emperor. In 1073 Hildebrand, or Gregory VII. as he was then called, one of the noblest bishops Rome ever had, secured at Canossa the complete humiliation of Henry IV., but the vexed question of lay investiture, which also formed the substance of the

quarrel between Becket and Henry II., was not finally settled by compromise till 1122. It was probably during the reign of the youthful Pope Innocent III. (1198-1216) that the papal power attained the summit of its glory, but up to the death of Boniface VIII. (1303) its supremacy was almost unquestioned, for the four crusades (1095-1202) had greatly enhanced its reputation.

Nevertheless, in the light of modern hist., the struggle between pope and emperor was a fatal disaster, for the former, by stirring up the It. cities against the latter, postponed for centuries the consolidation of the Ger. states into a united kingdom. The practice of pious frauds, the growth of corruption, within the C., the so-called Babylonian captivity when the popes stayed in France (1305-1377), and above all the schism (1378-1409), during which there were rival popes at Rome and Avignon, disabused men's minds of that fine conception of a world C. and a world empire mutually indispensable and working in harmonious accord. Thinkers revolted against the conclusions of scholasticism, as also against the persecutions of the Waldenses and Albigenses (1207 and 1229), and later of the Hussites and Lollards. The lowered esteem of the schools of philosophy, the relaxed conditions of life among the clergy, the growth of national feeling combined with the changed attitude to the Papacy prepared the way for a new period. With the Renaissance came also the Reformation to open up a new era in C. hist. As the direct outcome of the preaching of the religious leaders Luther, Zwingli, Melancthon, and Calvin, Protestantism was estab. in opposition to the older Christian C., which still acknowledged the pope as its head, and which from this time forth became known as the Rom. Catholic C. It was left to the Protestant delegates to the Council of Trent (1545-63) definitely to set forth those new doctrines, such as the priesthood of all believers and the absolute authority of the Bible in matters of faith, which left no loophole by which the two could ever be reunited (*see also Church of England*). *See* C. P. S. Clarke, *A Short History of the Christian Church*, 1929; 1948; A. Loisy (trans.), *The Birth of the Christian Religion*, 1918; P. Hughes, *History of the Church* (3 vols., A.D. 711; A.D. 1274; A.D. 1517), 1918, and (anct.) F. J. Bethune-Baker, *An Introduction to the Early History of Christian Doctrine*, 1903; A. R. Whitham, *The History of the Christian Church to the Separation of East and West*, 1920; (medieval) Count Lutzow, *Life and Times of Master John Hus*, 1909; (G. G. Coulton, *Five Centuries of Religion* (2 vols.), 1923, 1927; M. Deansley, *A History of the Medieval Church*, 1925; (modern), S. Cheetham, *A History of the Christian Church since the Reformation*, 1907.

Church of England.—In England Henry VIII. was recognised by Parliament as 'the only head in erthe of the Church of England.' The Eng. C. had been liberated from its subjection to Rome only to find itself under the heavy heel of a

temporal sovereign, whose will was law over all persons and 'in all causes ecclesiastical and civil within his dominions supreme.' The Reformation, in the sense of the setting forth of new formularies of faith, or of enforcing any change in the public worship or the ritual of the Eng. C., or, in fact, of breaking with the past in the matter of doctrine or ceremonies professed or observed in England up to the time of the great breach with Rome, can hardly be said to have begun when the reign of Henry VIII. came to an end. With the single exception of the Eng. litany, all public worship was celebrated in Lat., and though a copy of the Great Bible in Eng. was set up in the Cs., it remains still difficult to say when, by whom, and under what regulations the Eng. version so set up was publicly read. Great changes were to come, but they had to wait. During the reign of his son, Edward VI., the Common Prayer book was drawn up through the good offices of Cranmer, Latimer, and Ridley—a compilation which, with its Thirty-nine Articles of faith, has ever since remained the criterion of Christian orthodoxy in the Eng. C. Lutheranism, which flourished in Scandinavia and Germany, was too conservative of monarchical principles and Rom. ceremonies to retain a lasting hold in other European countries. Here, and especially in S. Germany, Switzerland, Scotland, and the Netherlands, the Calvinistic or Reformed Cs. sprang up; for in these the congregations were organised on a thoroughly democratic footing—an arrangement which recommended itself to men of radical leanings, whereas the rigidity of its intellectual doctrine appealed to men of sterner mould and in general to the less passionate character of the colder N. In Germany it was only after the peace of Westphalia (1648) that Protestants other than Lutherans won freedom of worship. The reaction against Protestantism, or the Counter-Reformation as it is called, was led everywhere by the order of Jesuits.

Beginning in Bavaria (1563), it swept through S. Germany, and appeared in France during the sixteenth century, and did not finally lose its impetus till after 1650. From the Reformation onward the hist. of the Christian C. cannot be set forth in any connected narrative, for the simple reason that, whereas hitherto the Catholic C. with the pope at its head had been a great riv. with which all other streams of thought could be connected, the main channel is now divided into endless branches, no longer linked by an all-embracing central organisation, but having Christianity alone, and that in its broadest sense, as a common basis. The complete divergence of the Reformed Churches came through the growth of a new theory, which gave rise to the so-called Free Cs., but which had played no part whatever in the great Reformation. Dissidents from estab. religious communities, eager to find some logical apology for their dissent, promulgated the doctrine that the Catholic C. was no actual and material organisation, but

rather a spiritual association of all the faithful throughout the world. Moreover, according to this doctrine every man is justified in seceding from one sect or C. and in forming or joining another, there being no such thing as schism between Christian bodies. Hence arose that enormous multiplication of sects which is so striking in America and in other countries of comparatively recent origin. Some attempt will now be made to trace the development of a few of these. Puritanism in England dates from 1567, and may be described as an attempt to subvert the episcopal system and to remove those rituals and ceremonies which still savoured of the odious Papists. The formal confession of the Puritans, offshoots of whom were the Baptists and Friends, was drawn up by the Westminster Assembly in 1643-1649. Under Charles II. episcopacy replaced independency, and nonconformists were persecuted by a series of Acts, including the Act of Uniformity (1662). Latitudinarianism, which grew up within the Anglican C. in the seventeenth century, was an attempt to steer a middle course between the Churchmen and Puritans, whilst Deism was a futile attempt to reconcile Christianity with that philosophy and natural science which were then attracting so much serious attention.

Eng. Methodism was founded in 1739, after its leaders, Wesley and Whitefield, had been driven from the Anglican C. They developed no new doctrine, but aimed rather at a deeper realisation of the spiritual life, and were forced by the action of the C. to organise a new sect—a course certainly against their natural inclination. Methodism spread rapidly among the poorer classes, and twenty years after Wesley's death embraced 100,000 members. The Evangelical party whose stronghold was Cambridge, was the direct outcome of the reaction of Methodism on the Estab. C.; it numbered among its adherents some of the greatest churchmen of the day. About 1833 the Tractarian movement emanated from the High C. movement in Oxford: no doubt it was largely stimulated by the contemporary revival at Cambridge. This religious phase has been well described as an æsthetic development from the so-called Romantic movement in poetry and art. The chief doctrines to which attention was re-directed by the Tractarians were the divine authority of the C., baptismal regeneration, the real spiritual presence of our Lord in the holy communion and its sacrificial character, apostolic succession, and the divine origin and necessity of episcopacy. In the eyes of many the Tractarian movement seemed to have a Rome-ward tendency, and was therefore to be strongly opposed. The publication of Tract XC. by J. H. Newman, who argued that the Thirty-nine Articles condemned abuses of doctrine rather than the doctrines themselves, brought matters to a head. Bishops condemned the tract; Pusey, one of the leaders in the movement, was suspended by the univ. authorities. Meanwhile Newman had retired. Some of the younger followers of the Trac-

tarians had already drifted to Rome. In 1845 Newman seceded also, and was followed by many Anglicans of learning and ability. Pusey, Keble, and others, however, remained faithful to the C. and succeeded in establishing an Anglo-Catholic wing within the C. of England. The Anglo-Catholics adopted the ritual and doctrine of the Rom. C. but refused all allegiance to the pope. Finally there grew up the Broad C. party, who counted Kingsley, Dr. Arnold, and Dean Stanley among their chief lights. Though they were all loyal supporters of the Anglican body, these men urged a wider liberty in the subscription of creeds and in the interpretation of dogmas, and whilst minimising the importance of ceremonies and vestments and of the evangelical doctrine of sovereign grace, were insistently anxious to preserve the unity of their C. The above is the crudest outline of what followed the Reformation in England.

In Scotland national character and the personality of Knox gave the movement a different and peculiar development. The confession of faith sanctioned by the Scottish Parliament (1560) followed swiftly on the covenant signed by the Scottish nobility who were then known as the Lords of the Congregation. It was useless for Mary to try to restore Rom. Catholicism, or for James I. to attempt to foist Anglican dogmas on an unwilling people. The Presbyterian constitution was drawn up in 1592, and the Solemn League and Covenant of 1638 was an effectual remonstrance against the introduction of the liturgy. The Relief and Secession Cts. left the Estab. C. as a protest against the continuance of patronage and the *laissez-faire* attitude of the General Assembly. In 1843 the Non-Intrusionists—that is, those who held that no minister must be intruded on an unwilling congregation—separated to form the Free C. of Scotland, whilst four years later the Relief and Secession Cts. coalesced and adopted the name of the United Presbyterians. In Ireland an overwhelming majority has always been Catholic, the Protestants being chiefly confined to Ulster. The glaring injustice perpetrated by James I., who handed over the whole eccles. endowment of this country to Anglican clergy, was eventually remedied by the Irish Church Act of 1869, which arranged for the disestablishment of what is always known as the C. of England in Ireland. The assembling of the Pan-Anglican bishops for the first Lambeth Conference in 1867 manifested a wider vision of the mission of the Eng. C. The conference, which has no legislative authority, meets at intervals of ten years for the discussion of questions of outstanding importance to the work and witness of the C. in the light of the experience of the episcopate. It has been attended by increasing numbers of bishops, and their encyclical letters and the reports of the committees have had increasing weight among churchmen.

An Act of Parliament, disestablishing the C. in Wales, was delayed from becoming operative by the outbreak of the

First World War, but after final revision and amendment in 1919, came into operation in 1920. Between 1920-27 a proposed revision of the C. of England prayer book caused much debate, not only in that body but also among nonconformists. A Bill to authorise the use of a revised version was defeated in Parliament. (See under PRAYER BOOK OF COMMON.) Other notable discussions of the time centred on the effects of modern scientific conclusions on religious belief, particularly in America, where anti-science groups adopted the title of Fundamentalists (*q.v.*).

The report of the archbishops' commission of theologians on Christian doctrine, pub. on Jan. 14, 1938, comprised the results of fifteen years of study by a commission appointed in 1922 by the archbishops of Canterbury and York. On the sources and authority of doctrine the report said that the authority of the Bible does not prejudice the conclusions of historical, critical, and scientific investigation in any field, not excluding that of the biblical documents themselves. The 'Church has always claimed that its doctrine is based on scripture, and therefore the commission places scripture first and the Church second. The authority of the Church's official formulations always rests, at least in part, on their acceptance by the whole body of the faithful, in view of its wide range and varied quality of spiritual experience, and of the witness borne alike in the practice of Christians generally, and in the doctrine of the theologians, to the truth of the gospel. The weight of this *consensus fidelium* rests principally on its continuance through the ages and the extent to which it is genuinely free.' On God and the world the report, by implication, denied the existence of any complete distinction between natural and revealed religion. A 'strict physical determinism' cannot be reconciled with Christianity. While 'many regard a miracle as a striking demonstration of the subordination of the natural order to spiritual ends, others regard it as less congruous with the wisdom and majesty of God than the observance of a strict physical uniformity.' Original sin was strongly affirmed in the report. The theological and religious values of the doctrines of the virgin birth and the resurrection are set out clearly in the report. It is, however, allowed that some members of the commission, while accepting the reality of the incarnation, regard the virgin birth as less consistent than a purely normal birth with the completeness of the incarnation. On sacraments, the report stated that the C. of England 'neither enjoins nor advises the regular and universal practice of auricular confession. Nevertheless the Church does not minimise the need of confession and absolution.' Confession to an authorised representative of the C. recognises the injury done to the whole body by sin, and also meets a deep-seated instinct of human nature. Finally, on the future life, the report stated that the predominant con-

temporary concern is with the personal destiny of individuals. In the N.T. this motive is secondary, and the chief concern is with the fulfilment of the purpose of God, to which the destiny of the individual is subordinate. That purpose is wrought out partly through hist., but for its complete working out it requires a new creation, not only of men, but of the earth and the heavens. Traditional orthodoxy has tended to take the scriptural imagery of the last things semiliterally, and to explain that the time of Christ's coming has been merely postponed. In a sense, however, the real heart of the eschatological message is to be found in the assertion of the immediate relation of human life here and now to eternity, judgment, and the triumph of God. It is therefore suggested that a truer perspective may be secured by taking the imagery in a symbolical sense, and affirming the continuous and permanent relation of the perpetually imminent eternal order to the process of events in time. In the last century of missionary and colonial expansion, there have grown up many overseas bishoprics. At the beginning of the last century there were but two colonial bishoprics, Nova Scotia and Calcutta. There are now over twenty-five dioceses in Canada alone, and some 124 colonial and missionary bishoprics. New Cts. have sprung up within the Anglican communion, but outside the boundaries of the Eng.-speaking race. The last quarter of a century or more has seen the organisation of the self-governing Cts. of Uganda, Japan (Nippon Sei Kokwai), China (Chung Hua Sheng Kung Hui), and India. Another notable step forward has been the increase of interdenominational co-operation, not only in such bodies as the student movement, but in the United Missionary Council, which has been able to bring before the gov. its views of the united missionary societies on various points of policy. These analogous signs of life are inevitably accompanied by an accentuation of different points of view within the C. of England, and by a sharper distinction between different schools of thought on matters of teaching and observance; but emphasis on the spiritual importance of the points in dispute has led also to an increased zeal for evangelisation of outsiders. See also ENGLAND, CHURCH OF, where will be found a bibliography.

Russia and the East.—The chief events of C. hist. after the First World War were those that took place in Russia. From the time when the Soviet Gov. disestablished the Russian C. in 1918, the experience of Christian believers, Orthodox, Catholic or Nonconformist, in that country were of the most distressing nature, as each succeeding year brought new persecutions and punishments for those who attended places of worship. In 1929 atheism was recognised by statute as the state attitude toward religion, and only those who allowed themselves atheists were permitted the legal right to teach their beliefs. C. buildings were seized as the property of the State and provision

was made that any group of twenty citizens might lease a C. from the State. Religion was entirely banished from the teaching in schools, though teaching religion in private was still permitted. In spite of the severity of the new Acts the Cs. opened as usual and the services drew large attendances; a condition of things that led to such an outbreak of persecution as the rest of Europe has hardly known for centuries. This serious threat to religious liberty caused a number of earnest protests and entreaties to be sent to the Soviet Govs. in which Rom., Protestant, and Nonconformist Cs. of other countries united with the Gk. C. in their endeavour on behalf of their fellow Christians in Russia. Although freedom of religious worship was recognised later for all citizens of the Union, there is much anti-religious propaganda and the C. remains separated from the State: the parishioners give voluntary contributions for the support of the clergy. In 1943 Stalin agreed to the appointment of a patriarch and holy synod for the Orthodox C. in Russia.

The Church in Germany.—Pietism and Moravianism are two important issues for the orthodox Cs. of Germany. Spener and Francke, Pietist leaders, founded their *collegia pietatis* (1670) and *collegia philobiblica* respectively, and Halle soon became the heart of the new C., just as Geneva had been of Calvinism—a heart from which arteries carried the new religious ideals to many foreign countries. Moravianism, as it was preached by Zinzendorf, was merely a development from Pietism, both religions laying stress on the necessity of the closest fellowship between every member and Jesus Christ, and giving prominence to the doctrine of regeneration and sanctification rather than that of justification by faith.

The Church in France.—Deism, to which reference has already been made, blossomed anew in France. Here it found many adherents during the reign of Louis XIV., and was afterwards metamorphosed by the *encyclopédistes* into what was known as Atheism, and also into the religion of materialists. During the stormy years of the Great Revolution the most daring and unparalleled experiments were made in the field of religion as of politics, but these experiments, according to Hase, only served to prove beyond possibility of doubt not only the necessity of religion for a civilised people, but also the national indispensability of a C.

The broad tendency to be noted in the Rom. Catholic C. subsequent to the Reformation is towards Ultramontanism—that is, towards the recognition of the pope as the infallible head of the C., a doctrine that was proclaimed by the Vatican council in 1870. Thus, where any doctrine is in question or under dispute, the final and supreme decision as to whether that doctrine bears the true Catholic stamp, or, in the words of the famous canon, is 'quod semper, quod ubique, quod ab omnibus creditum est,' rests with the pope. This much controverted doctrine has often been confused with impeccability or personal inferrancy.

The Greek Church.—As regards the Gk. or Orthodox C., which grew out of the E. C., the reader is referred to the special article on that subject, but it cannot with propriety be completely neglected in this present abstract. Although the capture of Constantinople by the Turks (1453) doomed the Gk. C. as a political force, its spiritual ascendancy still remained paramount in spite of the fact that its four patriarchates were continually threatened with submersion by the inroads of the Moslems. Yet its activity was arrested when it fell under Turkish rule, and abroad it numbers few proselytes. The patriarchs of Constantinople, Antioch, Jerusalem, and Alexandria have equal authority, and decide all questions of doctrine and worship. In spite of the efforts of Melancthon, Crusius, and the renowned Lucaris—all apostles of reform—the Gk. C. remained almost indifferent to the gospel of Reformation. But, like the W. C., it has again and again suffered from a process of disintegration, the most important branches being the Ethiopian C. of Abyssinia, the Jacobites of Syria and N. Africa, the Armenians of European and Asiatic Turkey, the Maronites, and the Nestorians. The Orthodox Gks., before the Russian revolution, were numerically strongest in Russia, but are found in all the Balkan states, besides Turkey in Asia. Unlata are members of the Gk. C. who wish to heal the differences between the scattered and dismembered communities, and who therefore acknowledge the papal supremacy. The Cs. of Rumania and Yugoslavia style themselves autocephalous; those of Greece and Bulgaria are independent, the latter acknowledging the supremacy of an exarch.

The Church in the U.S.A.—The early hist. of the C. in the U.S.A. is bound up with the struggle between the Puritans, many, if not most, of whom were hostile to control from England, and the clergy sent out from the latter country. Prior to that period the Jesuits sent out missions to America, though the first missionaries in the New World were Franciscans and Dominicans. In the sixteenth century began the arrival of the new order of Jesuits. Taught by experience the Jesuits took care to concentrate their converts into settlements, these converts, so far as the U.S.A. are concerned, being Indians of the Sp. possessions of California. The more striking Jesuit successes, however, were won in Canada and in Paraguay. In Quebec the first Jesuits arrived in 1611, and began mission work among the Indians in 1615, continuing their labours until they were expelled in 1761, after having in the meanwhile endured almost incredible hardships from cold, squalor, and the indifference of their converts. The forests of N. America, in what was then New France and subsequently became Canada, were, indeed, the scene of the most heroic Jesuit missions in the whole hist. of the C., and names like that of Champlain, who made the first permanent settlement (1609), are famous in Canadian hist.

As has been often said, the greatest achievement of the Puritans was the

settlement of New England, where, in their new world 'they redressed the theological balance of the old.' Throughout these earlier years, following the pilgrimage of the *Mayflower*, there was a bitter conflict between the Separatists and those who still regarded the C. in England as their sole external authority in matters of religion. There were famous names among the non-Separatists, including men like John Harvard, the founder of Harvard College, but the majority of Puritans in America were Separatists, or men who wished on principle to separate not only from corruptions in the C., but from a C. which tolerated corruptions. Independent or Congregational principles prevailed among them, each congregation being an independent brotherhood bound together by a mutual covenant. The C. or congregation was accordingly the source of whatever external authority there was, and the community was organised on a theocratic basis. Discipline was rigorous, no distinction being made, for example, between sin and crime, and maypole revels and the celebration of Christmas Day were penal offences. Throughout the seventeenth century the Puritans were in the ascendancy, and they extended no kind of toleration towards those who disagreed with them, and were, moreover, jealous of their hard-won privileges. Early there were collisions with the Anabaptists, who, however, differed little from the Congregationalists except in the matter of infant baptism. The first Baptist C. in America was founded at Providence, by Roger Williams, an extreme Separatist, who, as an advocate of toleration, wrote a tract *The Bloody Tenent of Persecution*, which was answered by Prynne. In his enthusiasm for toleration Williams afterwards founded the colony of Rhode Is. in 1644 for the express purpose of furthering toleration. On at least two occasions Charles II. intervened in favour of toleration for Separatists in America, once on behalf of the Anabaptists and again in order to secure better treatment for the Quakers, who were accused of defying all civil authority. A royal letter of 1661 requesting that corporal punishment of Quakers should be discontinued gave the Quakers some relief, but in general their zeal was of so provocative a nature that the respite proved but temporary. Apart from the Jesuits, the Moravians were the only influential missionary agency prior to 1800, though the Society for the Propagation of the Gospel had over fifty missionaries distributed over New England, New York, New Jersey, Pennsylvania, Carolina, and Georgia, and their ministrations were given not only to the colonists, but also to the Negro pop. and to the Indians.

The most far-reaching event in the religious hist. of America in the eighteenth century was the movement called the Great Awakening which began in 1735 and lasted until 1760. It was a Pietistic movement which preceded the arrival of the Wesleys, and the chief figure in it was the famous preacher, Jonathan Edwards,

whose book, *Narrative of Surprising Conversions*, proved so great an influence over Wesley himself that he joined the Moravian brethren in their journey to Georgia in 1736. Methodism proper did not begin in America until thirty years later, the first Methodist bishop being Francis Asbury, whom Wesley sent out in 1771. The movement thereafter spread quickly, and Methodism is said to be to-day the most powerful religious body in the U.S.A. The most remarkable influence in the Great Awakening was the emotional preaching of George Whitefield, and it is frequently said that no one ever preached to such vast crowds or received such popular adulation as Whitefield did in America. On the other hand, Wesley's first visit, namely to Georgia in 1736-37, was a failure, a consequence of his insistence on baptism by immersion, his refusal of sponsors who were not communicants, his rejection of dissenters except on re-baptism, and the personal nature of his sermons, all of which considerations alienated the settlers and eventually brought him into conflict with the Moravian brethren themselves.

There was a reaction, however, during the war of Independence, when Rationalism spread from Europe to America. The remarkable influence of Tom Paine's *Age of Reason* in the U.S.A. was due partly to the fact that its *réchauffé* of Voltairian cynicism by way of expounding the common Deist objections to the Bible, were calculated to appeal to a more uneducated type of colonist grown discontented under the anarchy of *laissez-faire*, and the more prone to sympathise with Fr. opinions because their allies in Quebec were of that nationality; and furthermore, Paine himself was popular for having fought for the colonists in the war of Independence. The way, too, had been prepared to some extent by the Universalists, whose movement had begun a decade before, but was only reorganised on a definite basis for the first time some thirty years later, when the parent body was estab. in Massachusetts. The doctrine of Universalism as expounded by Hosea Ballou, an excommunicated Baptist, assumed the final salvation of all men and denied the Trinity.

There is no estab. C. in the U.S.A. The constitution of the U.S.A. expressly provides 'that Congress shall make no law respecting an establishment of religion or prohibiting the free exercise thereof.' But though there is no estab. C., there is a considerable following of the C. of England, which in America calls itself the Episcopal C. Anglicanism, however, had a hard struggle in the U.S.A., the colonists of New England, in the seventeenth century, being intolerant of it; and it was not until after the lapse of many years that the episcopal clergy from England obtained a permanent footing in the country. The C. was, however, early endowed in Virginia, and also in Maryland. Early in the eighteenth century the S.P.G. kept episcopacy alive in America through their missions to the Indians in New York, and for the better

part of the century supported over 300 ordained missionaries in the country, of whom, as we have seen above, Wesley was one. There was a set-back during the War of Independence, when episcopacy, which elsewhere than in Connecticut had close ties with England, was openly aspersed for that reason; and in the S. the existence of the C. practically ceased. The Amer. historian L. W. Bacon considers that the real revival of Anglicanism in America dates from the consecration of Bishops Griswold and Hobart in 1811. Among the chief representatives of Anglicanism in America at this time were John Henshaw, bishop of Rhode Is., who pub. *The Apostolic Ministry* on apostolical succession, and Richard Moore, bishop of Virginia. Some twenty years later a ritual movement began in America, and though it encountered, as in England, much hostile criticism for alleged superstitious practices, yet, generally speaking, the question of rites and ceremonies was settled far less acrimoniously in America than in England. In spite of occasional internal discords, the growth of the denomination in America continued to be rapid and enduring, and it is remarked by Bacon that 'no fact in the external history of the American Church at this period is more imposing than the growth of the Episcopal Church from nothing to a really commanding station.' See also CLERGY; CLERGY DISCIPLINE ACT. See J. Edwards, *Works*, 1806-11; A. Andrews, *The Ecclesiastical History of New Britain*, 1867; L. W. Bacon, *The History of American Christianity*, 1899; Platner and others, *The Religious History of New Britain*, 1917; H. K. Rowse, *A History of Religion in the United States*, 1924.

Church, States of the, or the Papal States (in It., *Stati Pontifici*, *Stati della Chiesa*, etc.), were those portions of Italy formerly under the dominion of the pope. The temporal rule of the papacy, which dated from the bestowal of the exarchate of Ravenna upon Pope Stephen II. by King P  pin, and reached its height under Innocent III (1198-1216), was finally suppressed in 1870. The total area of the states in 1859, the last year of their entirety, was 16,000 sq. m.; the pop. six years earlier being over 3,000,000. Legations were ruled by cardinals, delegations by prelates. With two small exceptions, the papal states may be said to have formed a compact prov. bounded on the N.E. by the Adriatic, on the S.E. by the kingdom of Naples, on the S.W. by the Mediterranean, on the W. by Tuscany and Modena, and on the N.W. by the Lombardo-Venetian kingdom. In 1930 a Concordat between the It. Gov. and the papacy granted the pope independence and the control of a small area known as the Vatican State. See G. Botero, *Discorso*, 1605; J. Guiraud, *L'Etat pontif.*, 1896; A. Eitel, *Kirchenstaat unter Clemens V.*, 1907; R. Maccagn  , *L'eglise m  rovin-gienne et l'Etat pontif.*, 1929.

Church-ale, kind of ann. church festival in medieval England at which quantities of ale were drunk. (For the compound,

cf. *bridal, scot-ale*.) It was held in the churchyard or near the church, usually at Whitsuntide or Easter. The profits were often used for church funds or charitable purposes. Music, bull-baiting, dice, and dancing formed the amusements. The practice died out after the Reformation, and was always strongly denounced by the Puritans. The nearest modern equivalents are village fairs or wakes. See Philip Stubbs, *Anatomie of Abuses*, 1583.

Church Army, mission of the Church of England estab. in 1882 by the late Prebendary Wilson Carlile, C.I.L., D.D., as a working people's mission to working people. It has maintained this characteristic throughout many changes and developments. The evangelistic work includes a training college for evangelists and mission sisters, and for men and women representatives of various pars. during special Evangelistic Week-ends; parochial evangelists and mission sisters working as lay helpers of the clergy in various pars.; mission vans visiting remote country pars.; missions at the seaside, in prisons, public assistance institutions, and slums; and news teams in many dioceses. The social work includes lodging and residential hostels throughout London and the provs. for the reception of tramps and working men; lodging hostels, moral welfare work, homes, hostels, etc., for women, girls, and children. In various parts of the country there are also homes for elderly men and women. There are also youth centres and clubs. In addition to carrying on and developing most of its normal work the C. A., working on behalf of men and women on foreign military service, has provided rest and recreation centres, hostels, clubs, mobile canteens, libraries, etc. C. A. Housing Ltd. has built upwards of 1000 houses and flats which are let to poor, large families. 'Churchill' houses are being purchased and adapted to let at low rentals to elderly people who need security with independence. Everything is done under episcopal authority and in co-operation with the parochial clergy and responsible chaplains. The C. A. work is also carried on in many other parts of the world. Headquarters: 35 Bryanston Street, London, W.1.

Church Assembly, The, was set up in 1920 for the purpose of co-ordinating the work of the scattered units of the Church of England. It consists of three Houses, composed of bishops, clergy, and laity. The assembly is free to discuss any proposal concerning the Church of England, and to make provision in respect of such matters, but where this includes par. sanction for any alteration contemplated, this authority is to be sought under the Church of England Assembly (Powers) Act, 1919, which is commonly known as the Enabling Act. Suggested alterations in doctrinal formul   or in services or ceremonies or in the administration of the sacraments must be voted upon by each of the three Houses sitting separately, then by the Assembly, and finally by the House of Bishops. Parliament has the right of veto in the last instance in view

of the close association of Church and State. The Church of England Assembly (Powers) Act enabled the Church to become, for the first time, articulate as a body, and since it became operative many measures of reform have been passed, including the Clergy Pensions (Amendment) Measure, 1927; Representation of the Laity Measure, 1929; Ecclesiastical Dilapidations (Amendment) Measure, 1929; Clergy Pensions (Older Incumbents) Measure, 1930, and many others. None of the powers belonging to the convocations of Canterbury and York is to be diminished or derogated by the Assembly, which is also prohibited from exercising any power or performing any function distinctively belonging to the bishops by right of their episcopal office.

Church Association, founded 1865, with the object of 'maintaining the principles and doctrines established at the English Reformation and of preserving the purity of Protestant worship in the Church of England.' A strong Low Church body, it has formed a Protestant electoral association in many of the parls. bors. and divs. of England. Its organ is the *Church Intelligencer*. Address: 13-14 Buckingham Street, Strand, London, W.C.2. See *Official Year Book of the Church of England*.

Church Brief, see *BURR*.

Church Congress, name of free gatherings of both ministers and laymen of the Church of England, annually convened for free discussion of great questions concerning Church and State. The first was held at Cambridge in 1861. The attendance is usually large, including bishops and lower dignitaries. Full reports of each session are pub. Since 1875 similar congresses have been held in the U.S.A., when the General Convention does not meet.

Church, Alfred John (1829-1912), Eng. classical scholar, educator, and author, master at the Merchant Taylors' School, 1857-70. With Brodrick he trans. Tacitus (3 vols., 1862-77). He is best known for his attempts to popularise the classics. His *Stories from Homer and Stories from Virgil* appeared in 1878. He also wrote *Stories from the Greek Tragedians* (1879); *Stories from Livy* (1882); and *Stories from Herodotus*. Other works are *Roman Life in the Days of Cicero* (1883); *Carthage* (1886); and *The Crusaders* (1903). C. ed. *Horæ Tennysonianæ* (trans. into Lat. verse) (1868).

Church, Sir Arthur Herbert (1834-1915), Eng. chemist and scientific writer, prof. of chem. in the Agric. College of Cirencester, 1863; at Royal Academy of Arts, 1879-1911; lecturer at Cooper's Hill, 1888-1900. Among new minerals discovered by C. are churchite (called after him), and the animal pigment turnacin. He was president of the Mineralogical Society, 1898-1901. He carried out researches in various branches of chem., and besides scientific memoirs his works include *Precious Stones* (1883); *English Earthenware* (1884); *English Porcelain* (1885); *Food Grains of India* (1886); *The Chemistry of Paint and Painting* (1890);

Josiah Wedgwood (1894); *The Conservation of Historic Buildings and Frescoes* (1907). He was made K.C.V.O. in 1900.

Church, Sir Richard (1784-1873), Brit. soldier, one of the liberators of Greece, son of a Quaker, b. at Cork. He accompanied the expedition to the Ionian Is. in 1809, raising two regiments of Gk. light infantry in 1809 and 1812. C. was Eng. representative with the Austrian troops at the time of Napoleon's fall (1813-14), and served King Ferdinand of Naples from 1817 to 1820. On the outbreak of the Gk. revolution and war of independence he became general of land forces there (1827), but an attempt to relieve the Acropolis failed, owing to lack of co-operation. He was more successful in W. Greece, forcing the garrisons of Missolonghi and Lepanto to surrender (1828), but resigned his command in 1829. He helped in the revolution of 1843, which overthrew King Otho and gave Greece a constitutional gov., becoming general of the Gks. again in 1854. *Consult* Correspondence and papers of Sir R. Church (29 vols. in Brit. Museum); E. M. Church, *Sir R. Church in Italy and Greece*, 1895.

Church, Richard William (1815-90), Eng. divine, nephew of Sir R. C. (d. 1873), became fellow of Oriel, 1838. C. was an intimate friend of Cardinal Newman at this time, and allied to the Tractarian party. In 1844, as junior proctor, he vetoed a proposal to censure *Tracts for the Times*, No. 90, publicly. He founded the *Guardian*, 1846, and contributed also to the *Saturday Review*. C. became rector of Whatley, 1852, and was nominated by Gladstone to the deanery of St. Paul's, 1871. He declined promotion on Archbishop Tait's death. As an ardent high churchman he deprecated anti-ritualism, and urged toleration. Among his many works are *Civilisation and Religion* (1860); univ. sermons in *Human Life and its Conditions* (1876-78); a series of St. Paul's and Oxford sermons in *The Gifts of Civilisation* (1880); and *Sacred Poetry of Early Religious Discipline of the Christian Character* (1885); *Village Sermons preached at Whatley* (1892-97). C. wrote *Spenser* (1879) and *Bacon* (1884), for the Eng. Men of Letters series, both admirable works. Other works are *The Beginning of the Middle Ages* (1877); *The Oxford Movement* (1891). C. ed. Hooker's *Ecclesiastical Polity*, i., 1868, and with Paget revised Keble's ed. of Hooker, 1888. See M. C. Church, *Life and Letters of Dean Church*, 1895; D. C. Lathbury, *Dean Church*, 1907.

Church Enabling Act, short title of an Act passed in 1919 setting up the Church Assembly (*q.v.*).

Church History, hist. of the Christian Church and religion, dealing not only with external matters such as its extension and its political and social relations, but also with its inner development in doctrine, ritual, and ceremonial. C. H. is divided into three main periods: *Ancient*, usually dated to the end of the pontificate of Gregory the Great (A.D. 590), but carried by some to Charlemagne's foundation of the new empire

(A.D. 800); *Medieval*, which closes with the Reformation; and *Modern*, from the Reformation to the present day. (A sketch of these three periods is given under CHURCH). Here we shall deal only with the development in the treatment of C. H. Our earliest documents consist of the books of the N.T., and various scraps of information contained in the letters and writings of the early fathers. In the second century, Hegesippus, a Jewish Christian, compiled some memoirs of the early days of the Church, but only a few fragments remain. Eusebius of Cæsarea, who wrote in the early part of the fourth century, is known as the father of the Church history. He gave an account of the Church of the first four centuries, and his work was continued in the next century by Socrates, Sozomen, and Theodoret. All these were produced in the E., whence no important Church historian but Nicophorus Callistus in the fourteenth century has arisen since. Rufinus trans. Eusebius's *History* into Lat., and fresh continuations were made by Theodorus Lector, Evagrius, Theophanes, etc. A trans. of the works of Socrates, Sozomen, and Theodoret was made by Cassiodorus in the sixth, and this compound work, known as the *Historia Ecclesiastica Tripartita*, formed the medieval text-book on the subject. Among other early names may be mentioned Sulpicius Severus, Jerome, Idatius, Prosper, Victor Tununensis, Isidore of Seville, Gregory of Tours, Bede, and Paulus the Deacon. In the later Middle Ages, the chief names are those of Haymo of Halberstadt, Anastasius, Ordericus Vitalis, and Otto of Freising. The greatest, however, is that of the Dominican, Antoninus of Florence (archbishop, 1446-59), whose work is often modern in its aspect. Since the Reformation there has been a steady stream of hist., at first largely polemical. The *Magdeburg Centuries* was a Lutheran attempt to show the primitive nature of Protestantism, and called forth the *Annales Ecclesiastici* of the Rom. Catholic Baronius, who was later followed by Alexander Natalis (Noël), Bossuet, Tillamont, etc. The scientific and critical era of Church hist. began with the Ger. Mosheim, who was followed by Schröckh, Semler, Planck, and a host of others. The names of Neander and Baur rank with that of Niedner, and mention must be made also of Hagenbach, Schaff, Ritschl, Möller, Mohler, Hefele, Pastor, Flüche, and Martin. Harnack's *History of Dogma* also bears on the subject.

Churchite, see under CHURCH, SIR ARTHUR HERBERT.

Church Lads' Brigade, founded in 1891 by Col. W. M. Gee, and organised on the same lines as the Boys' Brigade. The C.L.B., however, is confined to members of the Church of England, and its purpose is to instil a regard for religion, health, and citizenship. The organisation is military in outline, and ann. camps are held each year. The movement has spread through the empire, and its enrolment is over 50,000 lads. It supplies

many missionaries to the Church, as well as church workers. The headquarters of the C.L.B. are at 58 Gloucester Place, London, W.1.

Church Missionary Society. This society was founded in April 1799 by a little band of about twenty-six men, among them being Wilberforce, Venn, Sharp, and Woodd. It resulted directly from the evangelical movement in the Church of England, but is now supported more widely by many schools of thought. Its original name, Society for Missions to Africa and the E., never came into practical use, and the full Church Missionary Society for Africa and the E., adopted in 1812, has come to be shortened to C.M.S. Missionary recruits were slow in offering themselves for service at first, and consequently many of the early missionaries were provided by Germany, among them Krapf, Pfander, and Rebmann; but the society has now and for many years past had on its roll over 1000 Brit. missionaries, and the present number is 1054, including 181 doctors and nurses. Associated with them in the work are 31,000 nationals of various countries, among them 216 clergy. The baptised Christian community connected with the society numbers over 1,000,000; and 516,380 students and pupils are being educated in its 6539 schools and colleges. The society's fields for foreign work are very extensive. Some of the earliest operations began in Sierra Leone, where the liberated slaves were settled; but the society is now at work not only in W. and E. Africa, but in Egypt, Palestine, Iran, India, and China, in all of which countries an indigenous Church has been estab. The C.M.S. has been instrumental in forming twenty-nine dioceses in various parts of these countries. The society's patron is always a member of the royal family; its vice-patron is the archbishop of Canterbury. Among the chief periodicals issued are the *C.M.S. Outlook* and the *Round World* (for children); the society also issues a number of books and other publications every year. Headquarters: 6 Salisbury Square, London, E.C.4.

Church of England, see CHURCH; ENGLAND, CHURCH OF.

Church Rates were formerly a tax levied in England and Ireland on all occupiers of land within the par. for the purpose of meeting the expenses incidental to the celebration of divine service and to the preservation and repair of the church fabric. The tax was assessed by the par. vestry. Property formed the basis for the amount which each tenant was required to pay. A dissenter might either be called on to appear in an eccles. court, or, if the sum were under £10, he might be ordered to pay by the local justices of the peace. Since the Compulsory Church Rates Abolition Act of 1868, maintenance of the churches has depended entirely on voluntary contributions, so that the rates are now only laid on actual members and supporters of the church.

Church Stretton, mkt. tn. and health resort of Shropshire, England, 13 m. from

Shrewsbury and 182 m. from London. It is picturesquely situated on the slopes of Longmynd, at an altitude of 700 ft. l'op. 1800.

Church Union (English), formed in 1859 as a consequence of the Protestant riots at St. George's-in-the-E., its purpose being to maintain unimpaired the doctrine and discipline of the Church of England against Erastianism, Rationalism, and Puritanism, and, further, to repel any attempts to seize the church endowments for secular purposes and resist all attacks on the Church's marriage laws. The organ of the C. U. is the *Church Observer*. Its offices are at Lord Halifax House, 6 Hyde Park Gate, London, S.W.7.

Churchill, John, see MARLBOROUGH, DUKE OF.

Churchill, Charles (1731-64), satirical poet, was the son of the rector of Rainham, Essex. His marriage at the age of seventeen prevented his going to a univ., but he was prepared for the Church, and took orders in 1753. He became curate to his father when he was ordained priest in 1756, and when his father died, two years later, he succeeded him as curate and lecturer at St. John's, Westminster. The Church, however, was not his vocation, and in 1763 he resigned his offices, probably under compulsion, for his disorderly conduct made it impossible to allow him to continue in them. Somewhat earlier he had looked to literature to supplement his meagre stipend, and in 1761 he pub. at his own expense, having failed to obtain a fair price for it from the booksellers, his theatrical satire, *The Rosciad*. This was at once successful, not only owing to its undoubted merits, but also owing to its numerous personalities. This was followed by other works, the best known of which is *The Apology*, all of which are distinguished by their robust satire and the vigorous versification. C. now became acquainted with Wilkes, and he wrote many papers for the *North Briton*. When Wilkes was arrested, after the issue of the notorious 'No. 45,' C. only escaped by his friend's ready wit. As a reply to Hogarth's caricature of Wilkes, he wrote the stinging *Epistle to Hogarth*; and when Martin forced a duel on Wilkes, he lampooned the aggressor in *The Duellist*. In Oct. 1764 he went to Boulogne to meet Wilkes, but was there taken ill and d. in his thirty-fourth year. The best accounts of C. are by John Forster (*Historical and Biographical Essays*, 1858) and J. L. Hannay (prefixed to the Aldine ed. of the poet's work, 1866).

Churchill, Randolph Henry Spencer, more commonly known as Lord Randolph Churchill (1849-95), was the third son of the seventh duke of Marlborough. Educated at Eton and Oxford, where he showed great intellectual powers. He was also passionately devoted to exercise, and was very fond of hunting. He left the univ. in 1870, and devoted the next four years of his life to Blenheim. In April 1874 he married the daughter of Leonard Jerome of New York, and in the same year he was returned for Wood-

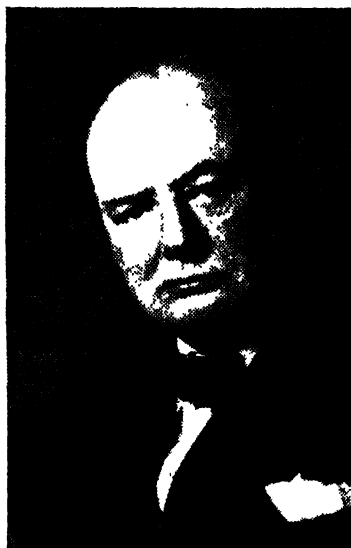
stock as the Tory member. During the early years of his parl. life he took no very great interest in parl. matters, although on at least two occasions his speeches attracted great attention in the House. During this period, however, he estab. his ideas concerning the gov. of Ireland, since he spent much of his time there, his father being the lord-lieutenant. In 1878 he attacked bitterly what he described as the 'old gang' of the party, and put himself up practically as the champion of orthodox Toryism. He, however, supported generally the policy of the Conservative Gov. The crushing blow which the Tories received at the general election of 1880, however, led to the formation of the Fourth party. This party, founded and led by Lord Randolph, had for its object the vindication of Conservative principles and the harassing of the 'old gang,' especially Sir Stafford Northcote. By this time C.'s speeches throughout the country had obtained for himself prominence as a politician and leadership in his own party. He began to advocate openly his principles of Tory democracy, which seem to have been based upon the theory, 'trust the people,' and which were to win for the Tories the suffrages of the masses. In 1885 he attempted to defeat Bright at Birmingham, and was ultimately returned as Conservative member for S. Paddington. In Salisbury's first administration he was secretary of state for India. After the defeat of the Home Rule Bill and the disintegration of the Liberal party, he became chancellor of the Exchequer and leader of the House of Commons. His resignation in six months was due to his inability as chancellor to acquiesce in the vote for supplies for the army and navy, and he probably thought that the mere threat of resignation would bring the gov. to their knees. He was mistaken; his resignation was accepted, and the ministry continued and flourished. After this period, he played no very active part in politics. In 1892 he was re-elected for Parliament, but during the session of 1894 he showed signs of mental and physical breakdown. His son, Winston C. (q.v.), wrote his life, 1905.

Churchill, Winston (1871-1947). Amer. author, b. at St. Louis, Missouri, U.S.A. Nov. 16. He graduated from the U.S. Naval Academy in 1894, but did not pursue a naval career, turning instead to editing the *Army and Navy Journal* and the writing of novels dealing with Amer. hist. and politics, in which he was very successful. He was a member of the New Hampshire State Legislature from 1903 to 1905. He formed an association called the Lincoln Republican Club to reform local politics, but the club was dissolved after C. had vainly sought to become governor. As he and the well-known Eng. statesman had the same name, were of about the same age, and both had written books, many people often confused them. Apropos of this, the Englishman once wrote an amusing and charming letter to his Amer. namesake. The Amer. novelist's best-known books are *The Celebrity* (1893); *Richard Carvel*

(1899); *The Crisis* (1901); *The Crossing* (1904); *Coniston* (1906); *A Modern Chronicle* (a study of the conflicts between ideals and realities) (1910); *The Inside of the Cup* (1913); *A Far Country* (on corrupt local politics) (1915); and *The Duelling Place of Light* (1917). Of these the second, third, and fifth, at least, became famous both in America and in Britain. After 1917 he went into retirement amid the New England mts., and only wrote one more book, *The Uncharted Way* (1941).

Churchill, Winston Leonard Spencer (b. 1874), Brit. statesman, soldier, and historian, eldest son of Lord Randolph C. (q.v.). He was educated at Harrow and Sandhurst, and entered the army in 1895. During the Sp.-Amer. war he served with the Sp. forces in Cuba. Between this date and the ending of the S. African war in 1902 he saw much active service: fighting in India, Egypt, and finally S. Africa. During the latter war he acted as the war correspondent of the *Morning Post*. On Nov. 15, 1900, he was taken prisoner by the Boers, but within a month succeeded in making his escape. In 1899 he contested Oldham in the Conservative interest. He won it the following year, at the khaki election, and he held it for nearly six years. When Chamberlain's Tariff Reform was launched in 1903, C. was one of the active opponents of any change in the fiscal system. At the election of 1906 he won N.W. Manchester in the Liberal interest. He had in the meantime been appointed under-secretary of state for the colonies in the Campbell-Bannerman administration, and proved one of the bitterest of opponents to the Conservative party. In 1908 he became president of the Board of Trade. He was, however, defeated at the by-election necessitated by his appointment. He soon obtained another seat at Dundee. He was peculiarly obnoxious to the militant suffragettes, who made him suffer much in all his election campaigns. In 1910 C. was appointed home secretary. It was during his tenure of this office that C. incurred a measure of quite unmerited ridicule at the hands of the opposition press for apparently superintending the 'operations' in Sidney Street, Whitechapel, when some Brit. infantrymen were detailed to fire on a house in which some foreign anarchists had taken refuge and which they were prepared to hold *à outrance*. He held this office for nearly two years, and was then appointed first lord of the admiralty. In his pre-war work in that office he conferred frequently with Lord Fisher, then in retirement. The fleet's excellent state of preparedness on the outbreak of the First World War was due largely to C. The naval brigade that C. procured and personally directed at Antwerp delayed the fall of that city. On the recall of Lord Fisher to duty in Oct., he and C. projected a diversion in the E. The Dardanelles scheme was the outcome—disapproved by Fisher. On Mr. Balfour taking the Admiralty, May 1916, C. became chancellor of the duchy; but, not being included in the War

Cabinet, he resigned in Nov., and spent the early part of 1916 as lieutenant-colonel commanding the 6th Royal Scots Fusiliers in Belgium. Wrote an 'appreciation' of the battle of Jutland for the neutral press. Later, he sought solace in painting and, as 'Charles Morin,' sold his pictures. In July 1917 he succeeded Dr. Addison as minister of munitions, at which office he accelerated the supply in larger quantities of the requisite shells and other munitions for the final allied advance of 1918. In this work, however, his policy



Ellsott & Fry

WINSTON CHURCHILL

of increasing the munition workers' wages by 12½ per cent was freely criticised as materially contributing to the cost of the war; but the vital need of the moment was to secure the necessary output, a need which probably could have been met in no other way. His greatest triumph in this office was the organisation of tank construction on a large scale, and it is worthy of remark that C. was in a measure the originator of the tank. At the Armistice he became secretary for war and for air, and in that capacity he lent troops and other aid to the White or anti-Bolshevik armies in Russia. Here he has incurred much criticism, but apart from the sinister influence of the Bolshevik regime in these earlier years, which would have justified strong measures at the outset, it is to be borne in mind that the anti-Bolsheviks were allies of the Entente before the close of hostilities in the First World War. The defeat, however, of Adm. Kolchak prevented the

junction of his forces with those of Gen. Rawlinson, with the result that the only course was for the latter to evacuate the Brit. troops already stationed at Archangel and Murmansk. With the defeat of Gen. Denikin in the S., C.'s plans were frustrated and the last chance of restoring the old regime in Russia had gone. During his tenure of office as war secretary, C. rendered valuable and expert service in reorganising the regular army and in reconstituting the territorial forces as a second-line army available, with due constitutional safeguards, for foreign service. He was secretary for the colonies from early in 1921 until the Coalition fell in Oct. 1922, and again there fell to him tasks of great urgency by way of aftermath of the First World War. In Ireland he pursued a vigorous policy during the Sinn Féin outrages of those years and advocated reprisals. Subsequently, however, the Cabinet, largely at the instance of Amer. opinion, reversed its policy and made terms with Ireland, C. taking a prominent part in the generous settlement made with the newly created Irish Free State. At the Colonial Office, too, C. had much to do with the setting up of the mandatory rule of the Brit. Gov. in Iraq—a name substituted by C. himself for Mesopotamia as more in consonance with hist. and present boundaries—and in Palestine. In the general election of Nov. he lost his seat at Dundee to the Labour party, whom he had antagonised by a circular on military action in case of a general strike, which was characterised by his Socialist opponents as a strike-breaking device.

When Baldwin went to the country in Nov. 1924 C. stood for W. Leicester, and was again defeated by Labour. He dissented from the Liberal-Labour agreement to throw out the Baldwin Gov., and stood as an Independent candidate in a by-election in the Abbey div. of Westminster, but was defeated by the local Conservative. Back again at the parting of the ways, he stood as a Conservative in the general election of Oct. 1924, and was elected for Epping. Mr. Baldwin made him chancellor of the Exchequer, and he so remained while Baldwin's ministry lasted. During the general strike of May 1926, C. rode the whirlwind in the Ruritanian way described by H. G. Wells in *Meanwhile*. His budgets showed a gentle drift away from Free Trade, preserving and extending 'safeguards': his last, 1928, was coupled with derating (q.v.). Out of office once again, he was the chief critic of the National Gov.'s policy on the question of Indian autonomy; but in these ensuing years his most valuable work lay in his vigilant watch on the rate of Ger. rearmament, to which he never ceased to direct the attention of the gov. He was out of office from 1929 until the outbreak of the Second World War in 1939, when Mr. Neville Chamberlain, bowing to popular demand, appointed him first lord of the Admiralty. In this office his influence was immediately felt in the steps taken to combat the submarine and mine menace

—a task he had shouldered in the previous war under equally difficult circumstances. This was his old place in the Imperial War Cabinet during the First World War, but in the Second World War he became also head of a committee composed of the heads of the fighting services. The plight of Norway in 1940 was the acid test of the allied position. On April 11 C., repeating Chamberlain's pledge, said: 'We shall aid them to the best of our ability. We shall make peace only when their rights and freedom are restored' (April 11, 1940). But the collapse of the Norwegian campaign early in May brought about the fall of Chamberlain after a dramatic debate (May 8), in which C. chivalrously supported his chief; but, while the gov. was nominally sustained by a majority of eighty-one, it was obvious that when only 252 of 365 Conservatives in the House voted for the gov. the vote was in effect a heavy moral defeat for Mr. Chamberlain (q.v.). Yet C. himself did not escape criticism—on the ground of lack of boldness in the Norwegian campaign, criticism which was voiced by Adm. Keyes (q.v.), who resented the rejection of his offer to lead an attack on Trondheim. But C., even assuming that he had shown optimism in promising that the allied armies would 'cleanse the soil of the Vikings from the filthy pollution of Nazi tyranny,' had no real share in the responsibility for the major deficiencies which had wrecked that campaign. Moreover, it was common knowledge throughout Britain that ever since Hitler had been rearming C. had been hammering at the gov. of the day in an effort to persuade them of the dire need to arm against the struggle which he believed to be inevitable. Mr. Chamberlain now tried to restore the gov.'s position by broadening the basis of his ministry, but Labour refused his offers. When he resigned on May 10 C., who in his career had held every great office of state, at length achieved that of Prime Minister.

In effect the people of Britain chose him for their leader and never was popular trust more justifiably reposed in a national leader; for C., then in his sixty-sixth year, was setting out on a brilliant tenure of five years during which his incomparable gifts as a statesman and strategist were seldom at fault, and when the greater the disasters which befell the allied arms the more surely did he rise to every occasion—always the buoyant spirit inspiring a whole people with his own resolution and unswerving confidence in the ultimate issue. It was a tenure which, beginning in the bitter prospect of 'blood, toil, tears, and sweat,' ended in the blaze of victory, only to be followed by the defeat of the gov. a few weeks later by the resumption of party strife and the defeat of the Conservative followers of C.—a reversal of fortune which was in no way a reflection on C.'s leadership, but the normal reaction consequent on the break-up of a coalition, the dominant party of which had been the Conservatives. Disasters soon came after C.'s assumption of office, for the country was almost entirely unprepared for a

major war; but, in the midst of disaster, came the epic of the Dunkirk evacuation when C., tempering triumph with realism, warned the nation that 'victories were not won by evacuations.' In his new Cabinet of five (himself, Halifax, and Chamberlain representing the Conservative majority, with Attlee and Greenwood as representatives of Labour) C. continued to act as co-ordinator of the service depts. in the capacity of minister of defence. More than the change in personnel, however, was the change in spirit, the new spirit which C. himself infused into the gov. and the nation. 'Victory at all costs; victory in spite of all terrors; victory, however long and hard the road may be, for without victory there is no survival.' With the approach of the Fr. collapse C. was quite prepared, if necessary, for the nation to fight on alone. On June 12 the destiny of France came to a head when Weygand told the Fr. Cabinet that the war was lost. But though the Fr. Gov. decided that Britain must be asked to release France from her engagement of March 28 (to make no separate peace) C., with Lord Halifax and Lord Beaverbrook, flew to Tours on June 13 to resist this move. On June 16, after a further desperate appeal by Reynaud (Fr. Premier), C. made a dramatic proposal for the merging of the Brit. and Fr. Empires under a common citizenship in order to continue the war under a single War Cabinet, the two Parliaments to be formally associated—but the peace group in France showed no enthusiasm for a proposal which they said involved the loss of Fr. independence (which had now in fact virtually disappeared) and subjection to England. Soon afterwards Reynaud resigned and C. perforce gave up the idea of a further meeting with him.

The realism and effectiveness of C.'s policy in times of deepest stress and anxiety manifested itself in the face of the treacherous armistice concluded by Pétain (q.v.), which C. heard of with emotions of 'grief and amazement,' the 'terms of which might well strike a fatal blow at France's former ally.' For the Brit. Gov.'s acquiescence, albeit reluctant, in France's negotiation of a separate peace had been accompanied by one vital condition—that the Fr. fleet should be sent to Brit. ports and remain there during the negotiations; but in the result the Fr. fleet was preparing to go over to the Gers. and to resist Brit. action to turn it from that course. At the battle of Oran, C.'s Gov., having formally severed relations with the Pétain Gov., succeeded in thwarting Ger. hopes of acquiring this fresh accession of naval power (see further under NAVAL OPERATIONS IN THE SECOND WORLD WAR). Britain now had to fight on alone as 'the sole champions now in arms to defend the world cause. . . . We shall do our best to be worthy of that high honour' (C. on June 17). And always, throughout the darkening hours, C. would make some characteristic utterance which will survive in the language—as, for example, in the Battle of Britain (q.v.), 'Never in the

field of human conflict was so much owed by so many to so few,' in reference to the bravery of the Brit. pilots. C.'s most striking contribution, strategically, to the victory of the Allies probably lies in his Mediterranean strategy. He appreciated that the line through the Middle E. (q.v.) was the vital artery of the Brit. Empire; whence his anxiety to render harmless the Fr. fleet at Alexandria; whence, too, the 100 per cent reinforcements which the Brit. Mediterranean fleet received at the beginning of Sept. 1940 and his bold decision to send to the Middle E. Britain's one armoured div. Some broadcasts he uttered were highly effective, for example, that to the It. people (Dec. 23, 1940) in which he accused Mussolini of the sole responsibility for all Italy's woes and promised still greater calamities if he were allowed to continue his ruinous course. Thus for the first time a Brit. leader appealed to the spirit of revolution in an enemy nation and it may well be that his prophetic vision foresaw the 'jackal' Mussolini's doom. The loss of Cyrenaica early in 1941 was a sore disappointment to C., the Brit. generals on the spot having underestimated the weight of the coming Axis blow, and when ultimately Rommel (q.v.) reached Egypt, C. acted with dramatic firmness (see *infra*). Always bold, he decided that Crete should be defended, it being his belief, erroneous as it transpired, that 'we had a good chance of winning the battle.' Later, however, the scantiness of the available anti-aircraft artillery was adduced by him as the reason why more airfields had not been constructed in the is.; but in fact this did not explain the early fall of those that were in existence, and doubtless Ger. initiative and imagination had caught the Brit. by surprise.

Then C., faced with the seriousness of Britain's situation owing to the decline of shipping through heavy losses in the so-called battle of the Atlantic, called, in June 1941, on America for 'a gigantic building programme as the only true remedy,' and he did not appeal in vain; for, as C. had always said, 'if America would give them the tools, they would do the job.' C.'s relations with President Roosevelt were those of perfect mutual understanding and confidence. Towards the period when Ger. relations with America were growing more difficult owing to Roosevelt's policy of resistance far beyond America's territorial waters, he and C. met on a warship in the Atlantic when, as the result of the famous if somewhat impracticable Atlantic Charter (q.v.), Amer. policy took a vital step forward. If the principles of the charter hardly came up to allied hopes, which indeed in the circumstances looked for a programme of immediate action, the charter's long-range policy of appealing to the conquered nations with the presentation of a programme to which they could rally as active allies of the democracies was well conceived. And at least C. could announce that President Roosevelt had made it the joint purpose of America by decisive military victory

to prevent another war, and that together they had 'jointly pledged their countries to the final destruction of Nazi tyranny,' a statement which was borne out by the President's subsequent course in speech and action. In a memorable invocation to the conquered after the Atlantic conference, C. said: 'Keep your soul clean from all contact with the Nazis. Make them feel, even in the hour of brutish triumph, that they are the moral outcasts of mankind. Help is coming. Mighty forces are arming in your behalf. Have faith. Have hope. Deliverance is sure.' Memorable will always be C.'s prompt pledge of all aid to Russia made immediately on receiving intelligence that the Wehrmacht had invaded Russia, an offer more striking in view of C.'s unchanged views concerning Communism.

Again, when there were indications in Oct. 1941 that Japan was making preparations for further expansion in China, and before America had issued orders to withdraw the few Amer. marines then still in China, C. had promised immediate support. If the U.S.A. should become involved in war with Japan. A month later C., accompanied by a staff of military and technical advisers, had arrived in Washington to confer with Roosevelt on their common defence so as to secure unified direction in the different theatres of operations and co-ordination between the various sectors of the far-flung battle fronts. Matters went badly from the start in the war with Japan; for the gov. had sent out the battleships *Prince of Wales* and *Republie* with a view to building up allied naval strength in the Pacific; but the loss of these ships led to a somewhat critical debate in the Commons which opened (Jan. 27, 1942) on a motion of confidence in the names of C., Attlee, Sir Archibald Sinclair and Ernest Brown. In this three-day debate C. in his inimitable way pointed out to his critics many fundamental strategic truths and in the resulting div. there were 363 votes for C.'s Gov. and one (Mr. Maxton's) against. On June 18, 1942, C., with the Brit. chief of the general staff and other military authorities, made his second visit to America, for the express purpose of discussing the strategic situation with Roosevelt direct. Under C.'s lead the Brit. aerial effort against Germany was now growing apace, as was shown, for example, on the night of May 30, 1942, when over 1100 planes were concentrated in a mass attack on Cologne. This was followed by great daylight sweeps which further demonstrated the growing power of the R.A.F., a development which lent force to C.'s grim forecast that 'as the year advances Ger. cities, harbours, and centres of war production will be subjected to an ordeal the like of which has never been experienced by any country in continuity, severity, or magnitude.'

Difficult as was the path of the gov. in these fateful early years of the war it is possible to see the beginnings of the turn of the tide in C.'s decision to appoint Gen. Alexander as supreme commander

in the Middle E. and Gen. Montgomery as commander of the Eighth Army (q.v.). C. expressing himself as satisfied 'that this combination is a team well adapted to our needs and the finest at our disposal at the present time.' He had taken advantage of his visit to Moscow to investigate the situation in the Middle E. At the conference in Moscow, held early in Aug., C. with Roosevelt and Stalin, together with various military leaders, had a four-day discussion on strategic plans. C.'s changes in the Middle E. commands were soon followed by the remarkable Brit. victory at El Alamein (Oct. 23-Nov. 4), truly, with the concurrent battle of Stalingrad, the turning point of the war. The battle of Stalingrad was, however, not yet over and, moreover, the Gers. were concentrating with increasing intensity on submarine warfare. C. was well justified in his timely warning (Nov. 29, 1942): 'I know of nothing that has happened yet which justifies the hope that the war will not be long or that bitter and bloody years do not lie ahead'; but C. would have been the last to deny that the conditions of victory, notably in the progressive increase in the war potential of the United Nations partly effected through his own remarkable exertions, were becoming clearer and appearing steadily more attainable. In the matter of the 'second front,' it had been agreed between Britain and America to postpone an attack on Europe and to undertake an expedition to N. Africa, but it was left to C. to explain this delay to Stalin and to gain his acquiescence. One reason for the postponement was no doubt the increasing success of the Ger. submarine campaign. But, as C., in his report on the Casablanca Conference (Jan. 1943), had said, 'our duty to aid to the utmost in our power the magnificent, tremendous effort of Russia and to try to draw the enemy and the enemy air force from the Russian front was accepted as the first of our objectives once the problems of the U-boat war had been met in such a way as to enable us to act aggressively'—an assurance that was the key to all the plans and efforts of the Allies in the months that followed Casablanca.

C. fully supported the strategic task of night bombing imposed on the R.A.F., a policy that was certainly justified by its results. 'It was our settled policy,' said C. in his speech to the Amer. Congress (May 19, 1943), 'to make it impossible for Germany to carry on any form of war industry on a large or concentrated scale, either in Germany, in Italy, or in the enemy-occupied countries,' and in that speech he had hinted that the advocates of victory through air power might be given their chance to prove their case. While at Washington, C. took the opportunity of reassuring the U.S.A. that Britain's interests in the struggle with Japan were at least equal to those of the U.S.A. and that the Brit. would wage war side by side with the Amers. in accordance with the best strategic employment of their forces—a full answer

to those Amer. critics who, from ulterior motives, were casting ill-founded doubts on Britain's readiness to aid America against Japan once Hitler had been beaten. C.'s strategic gifts were once again evident in the conduct of the campaign in Italy in 1943, though there were not lacking critics who thought that valuable time had been lost between the fall of Mussolini and the delivery of the major assault on the mainland of Italy, a charge which C. vigorously refuted by the valid defence that the 'condition and the preparation of the landing craft were the sole and decisive limiting factors.' It is true that in the interval between July 25 and Sept 8 the Gers. had made ample preparations to meet invasion, preparations which some think could have been thwarted or checked by airborne invasion, commando attacks, or other prompt action in adequate measure if not on any full scale. But these criticisms might well seem to involve confusion between political issues and strategic or logistic considerations; for the gravamen of the charge was that the armistice with Italy had been unduly delayed and the allied air attacks in Italy suspended in the expectation that Marshal Badoglio would initiate negotiations for peace. C.'s retort was 'The truth is that the armistice was delayed to fit in with the attack and not that the attack was delayed to fit in with the armistice.' Time alone and the disclosure of the essential documents can determine these controversial questions, though the fact remains that by strenuous efforts the date of the invasion, originally planned for Sept. 15, was advanced by a full week, and even though the Allies may not have pressed their advantage to the maximum limits, their gains were immediate and substantial (see further under ITALIAN FRONT, SECOND WORLD WAR CAMPAIGNS IV). What is important to recognise is that C. never regarded the N. African operation and its sequel in Italy as a substitute for a direct attack across the Channel upon the Gers. in France or the Low Countries, but only as an essential preliminary to the main attack on Germany and her ring of subjugated and satellite states. With C. and his advisers the second front existed and was a main preoccupation already with the enemy, and 'on the the day,' he said, 'when we and our American allies judge to be the right time this front also will be thrown open and thrown into play, and a mass invasion of the Continent from the west and south will begin'—a promise which was fulfilled in ample measure on D day in June the following year. Speaking at Harvard (Sept. 6, 1943), C. enlarged on the steady advance in the fundamental unity of the Allies for war purposes, and even boldly challenged the ant. Amer. tradition of isolation, advocating an even closer unity for the future—a unity which he himself had advanced to some extent by leasing naval and air bases in Brit. overseas terr. in exchange for fifty Amer. destroyers (Sept. 1940). Of all the conferences

between C. and Roosevelt the Quebec Conference (which began on Aug. 11, 1943) was the most comprehensive; for then fundamental agreement on immediate ends was arrived at, including action in China, though once again as at Casablanca no Russian representative was present, the main cause of Stalin's impatience with his allies being the continued absence of a second front in W. Europe.

In the flying bomb period, in 1944, C. scorned the idea that Parliament should transfer its location to some safer city and called upon all who had duties in London to remain at their posts; and in view of the brilliant work of defence in overcoming this terror he was justified in his attitude. The internecine strife in Greece in 1944, coming on top of the political incidents in Italy of 1943, engendered in some political circles in Britain an idea that as victory was approaching C.'s policy was inclining to the support of effete regimes in Europe as against the popular forces which had emerged; nor could it be denied that the Brit. Gov. had manifested much greater sympathy with the exiled Gk. dictatorship in Cairo than with the popular resistance movement fighting in the Gk. mountainous regions; but the main preoccupation of C.'s Gov. was to maintain order in Greece and safeguard the distribution of food supplies. But fighting still continued in Athens, and to restore confidence in the gov. C., with Eden, foreign minister, flew on Christmas Eve to Athens. The results of his visit, however, were less spectacular than the visit itself, though C.'s presence there restored the confidence of the Gk. people in Britain's good intentions. In this year (1944) C. also visited the battle front in France, and indeed it was a feature of his premiership that he was so often overseas, whether at vital conferences or in theatres of war. In the Commons (Aug. 2) he disclosed for the first time some of the background of the campaign in France in the matter of planning and preparation and emphasised that they had had neither the experience nor the tackle to execute so vast an enterprise any earlier than they actually did. No impartial person could deny that C. had given a convincing answer to those ideological opponents who had demanded the opening of a second front without knowing what that great operation involved. On Sept. 10 C. went once again to Quebec to confer with Roosevelt, and there he and the President reached decisions on all points respecting the completion of the war in Europe and the destruction of Jap. power in the Pacific. Less than three weeks after his return from Quebec C. left England again for Moscow, accompanied by Eden and members of the general staff. This conference (Oct.) was the sequel to Quebec, the discussions concerning, chiefly, their common problems in E. Europe. In Feb. 1945 C. went to the important conference at Yalta, in the Crimea, where, with Roosevelt and Stalin, the Allies drew up a plan for the final

defeat of Germany, and the occupation and control of that country after her unconditional surrender. The conference also reaffirmed the Allies' common determination to maintain in the peace the unity of purpose and action which had made victory certain; but in the sequel at Paris in 1946, many months after C. had resigned, it soon became evident that the policies of the W. democracies and Russia were entirely divergent. The ultimate delimitation of Germany's boundaries was considered by a three-power conference at Potsdam on July 16, 1945, between C., President Truman, and Stalin, but certain changes had then already taken place and in the Commons in Aug. 1945, after the change of gov., C., in the debate on the King's Speech, said, as to the results of that conference, that it would be impossible to conceal the divergence of view which existed about the state of affairs in E. and Middle Europe. Early in April (1945), as victory was approaching, the exchange of recriminations between Conservative and Labour ministers heralded the break-up of the Coalition.

The end of war with Germany brought C. face to face with the question whether the time had come for a dissolution of Parliament or a general election. The Conservative party managers pressed him to hold an election in July as most favourable to Conservative prospects. C., however, sounded the Labour leaders on the possibility of continuing the Coalition Gov. until the end of the war with Japan, but their response was unfavourable, though they were willing to remain in the Gov. until the end of the session in Oct. On May 18 C. suggested to the Labour and Liberal leaders that they should remain till Japan was defeated and that then they should discuss means for taking the nation's opinion, e.g. by referendum, on the issue whether in such conditions the life of Parliament (which already had long exceeded its term) should be further prolonged; but in the result he committed himself to dissolving Parliament at the earliest possible moment, and on May 25 he formed a new gov. (the 'Caretaker Gov.') almost exclusively of Conservatives. Parliament was prorogued on June 15 and immediately afterwards formally dissolved. In the ensuing election campaign C. toured the provs. and was everywhere greeted with unbounded enthusiasm; but his audiences in many cases made it evident that they intended to draw a sharp line between his personality and the policies advocated by his party. In London he toured certain critical constituencies, but while his reception was again most enthusiastic, the dissent from his political views was even more marked. It cannot be said that in this campaign C. really rose above the partisan, his broadcast address on June 30, on the relations between the Labour party executive and Labour ministers, and in particular on the influence of the Labour 'caucuses,' being all too reminiscent of the 'Zinoviev Letter' tactics of 1924. The

results of the election disclosed a great victory for Labour. C. was of course elected (for Woodford) by a large majority; but he at once bowed to the verdict of the nation and on July 26 resigned. In the debate on the Address from the Throne (Aug. 1945) the new Prime Minister (Mr. Attlee) paid a warm tribute to C. for his services as a war leader. 'His had been,' said Mr. Attlee, 'a true leadership which meant the expression by one man of the soul of the nation and its translation of the common will into action. In undying phrases he had crystallised the unspoken feeling of all. He had radiated a stream of energy throughout the machinery of government. Indeed throughout the life of the nation. While many others had shared in the work of organising and inspiring the nation in its great effort, he had set the pace, and he had known how to bring into co-operation men of very different political views and to win from them loyal service. His place in history was secure, and though he was no longer at the head of affairs when final victory came, this really was the outcome of plans made long before under his leadership.' Pub. works *The Story of the Malakand Field Force* (1898); *The River War* (1899); *Savrola* (a novel) (1900); *London to Ladysmith via Pretoria* (1900); *Ian Hamilton's March* (1900); *Lord Randolph Churchill* (1906); *My African Journey* (1908); *Liberalism and the Social Problem* (1909); *The World Crisis*, 4 vols. (1923-29); abridged and revised ed. in one vol. (1931); *My Early Life* (1930); *The Eastern Front* (1931); *Thoughts and Adventures* (1932); *Marlborough*, 4 vols. (1933-38); *Great Contemporaries* (1937); *Arms and the Covenant* (speeches) (1938); *Step by Step* (1939); *Into Battle* (speeches) (1941); *The Unrelenting Struggle* (speeches) (1942); *The End of the Beginning* (speeches) (1943); *Onwards to Victory* (speeches) (1944); *The Dawn of Liberation* (speeches) (1945); *Victory* (speeches), 1946; *Secret Session Speeches* (1946); *Sineus of Peace* (speeches) (1948); *Painting as a Pastime* (1948); *The Second World War* (in course of pub.). For biographies of C. see A. MacC. Scott, *Winston Spencer Churchill* (a book of forecasts), 1905; C. Bechhofer Roberts ('Ephesian'), *Life of Winston Churchill*, 1927; H. Martin, *Battle* (a detailed study), 1940; Sir G. Arthur, *Concerning Winston Spencer Churchill* (character and opinions rather than achievements), 1940; R. Sencourt, *Winston Churchill* ('the story of a man who has the courage of his convictions'), 1940; L. Broad, *Man of War* (pocket reference book), 1940; R. MacG. Dawson, *Winston Churchill at the Admiralty, 1911-1915*, 1940.

Churchill River, rises in Lake La Loche (or Methy), Canada, between Rs. Athabasca and Saskatchewan, flowing through various lakes into Hudson Bay, near Fort Churchill in Keewatin. It forms the only harbour on the W. of Hudson Bay for large vessels at all states of the tide (6-8 fathoms deep), but has rapids only navigable by canoes, 5 m. from the month.

Lake Reindeer or Caribou connects it with Wollaston or Great Hatchet Lake and Mackenzie R.; La Loche portage with the Athabasca's trib., Clearwater. Known as C. R. as early as 1688 (probably after Lord Churchill—Marlborough). It is also called Missinippi, English, or Beaver R. It is about 900 m. long.

Churching of Women, public thanksgiving in church by mothers for their motherhood and recovery from the perils of childbirth. This religious usage (probably borrowed from the Jewish law, Lev. xii. 6) has prevailed in the Christian Church from early times. In former days the practice was usual, but among Protestants it is falling into disuse, though still obligatory in the Gk. and Rom. Catholic Churches. Presbyterian and Independent Churches of Britain and America reject the service. The Gk. rite also celebrates the presentation of the infant in the Church, the Lat. is exclusively a blessing on the woman (whose child is born in wedlock). The first definite mention is in the pseudo-Nicene Arabic canons. The formularies now used date only from medieval times.

Churchwardens are lay eccles. officers, who represent the body of the par., and are, as their name implies, guardians of the church. In all new pars., according to the Church Building and New Parishes Acts of 1818-84, they are appointed one by the minister and the other by the parishioners, and this custom prevails in England, but where a different practice has been time-hallowed no alteration need be made. Thus in some old London pars. the parishioners choose both wardens; in others they are appointed by the select vestry, the lord of the manor, or even the outgoing officers. They are elected annually, for the most part during Easter week, being required to make a declaration before the ordinary—usually the bishop of the diocese—to the effect that they will perform their duties in good faith. In early times the *Seniores ecclesiastici* merely had charge of the fabric and furniture of the church. To-day the wardens have to collect the offertories, provide the necessaries for divine service, protect and repair the building with its goods and fixtures, and also the churchyard enclosure, and assign seats to the parishioners. As the office of churchwarden is single, either officer holding an undivided moiety, the vicar's warden and the par. warden cannot legally act without mutual support. Those primarily eligible are resident householders, but habitual occupiers, who happen to be non-resident householders, may also be appointed. Certain classes, such as peers, justices, clergymen, etc., are exempt, whilst others, as, for example, aliens and felons, are ineligible. In the Rom. Catholic Church lay officials like the three *marguilliers* in pars. of France offer the nearest analogy to the Eng. C.

Churchyard, name of a piece of consecrated ground attached to a parochial church (thus differing from a cemetery), used as a burial-place. Cs. are often of earlier date than the church itself, since

Rom. law protected any area containing monuments of the dead with the utmost reverence. Burial in Cs. in England is ascribed to Cuthbert, archbishop of Canterbury (741-58). All Christian services may now be used at C. burials (Vict. 43, 44, chap. 41). The C. is the freehold of the parson. It may never be used for secular purposes, and misbehaviour of any kind within its precincts can be severely punished by law. See also under BURIAL ACTS.

Churl, see CEORL.

Churn, vessel or utensil for the purpose of making butter, by shaking the cream and so separating the serous from the fatty parts. The form of C. which for long held its position was an upright wooden vessel, shaped like a travelling metal milk can, in which the cream was worked by a wooden plunger by hand. To this succeeded a wooden box, in which moved a splasher, or dasher, a small wooden wheel, like a water wheel, turned by a crank by hand. Large Cs. are now turned by machinery, and revert in a way to the primitive form by being revolved or swung on themselves by mechanical means. Good Cs. should be of seasoned oak-wood, and so constructed with removable splashers or dashers that they can be easily and thoroughly cleansed after use. In modern large Cs. glass lights are fitted through which the butter can be watched as it begins to form, and the exact moment for withdrawing the buttermilk be ascertained. See BUTTER and DAIRY.

Churu, tn. of the native state of Rajputana, India, 100 m. from Bikaner. Pop. 14,000.

Churubusco, vil. situated on the Rio de C., 6 m. S. of Mexico City. Before the Sp. conquest there was a large Aztec city on the same site, called Huitzilpochtli, of which the name C. is a corruption. C. contains a stone convent which in later days was the stronghold of the Mexican defence against the Amer. troops under Gen. Scott at the important battle of C. on Aug. 18, 1847, during the Mexican war. The Mexicans under Santa Anna were eventually defeated, losing about 7000 men, the Amer. losses being only 1000.

Chusan Islands form an archipelago off the E. coast of China. The largest, C., is 20 m. long and from 6 to 12 m. wide; it is regarded as the key to China. There are sev. tns., of which the cap. is Tingha. Pop. 250,000.

Chusite, variety of olivine, which is itself a variety of chrysolite, from which Dana considers it to be derived.

Chust (*uz*, salt), tn. of the Uzbek Republic, Russian Central Asia, on Syr Darya, 32 m. from Namangan, 80 m. from Margelan, at the foot of the Chotkal Mts. Manufs. knives. Pop. about 15,000.

Chu Teh (b. 1886), Chinese soldier, b. at Ilung, Szechuan. A descendant of the mandarin class, he was trained at the Yunnan military academy and was given a commission in the army of Tai Ao, governor of Yunnan. He saw service in the 1911 revolution and at thirty was a brigadier general. But in 1916 he

exchanged a military for a political career. Tsai Ao appointing him successively Director of the Bureau of Public Safety and Prov. Commissioner of Finance. In these offices he seems to have found the opportunity to acquire considerable wealth; but, like Tolstoy, his birth did not preclude much sympathy with the serf class and he abjured his easy life, joined the Kuomintang and then travelled to Europe to study sociology and the writings of Marx, Lenin, and Bukharin and also took a course of instruction in Moscow (1926). When Chiang Kai-shek broke with the Communists, C. T. had to flee and thus ended his membership of the Kuomintang. With some hundreds of followers he waged guerrilla warfare on the frontiers of Kiang-si and Hunan, revealing considerable military talents. In May 1928 he joined forces with Mao Tse-tung (see CHINA, *History*) who was subsequently the supreme director of the Chinese Communists—and a Chinese Soviet state was proclaimed by them in the mts. of the Fukien Kiang-si border, with Mao Tse-tung as political organiser and C. T. as commander-in-chief. He was the outstanding military genius of the Chinese Communist army as was shown by his conduct of its retreat to Yen-an, the Communists' N.W. cap., after five years of campaigning against the enormous armies of Chiang Kai-shek. The successes of the Communist armies against the Nationalists were mainly due to the principles he inculcated in his followers though he did not lead the Communists in their conquest of N. China and their subsequent advance S.

Chutney, **Chutnee**, or **Chutny** (Hindu *chāṭni*), E. Indian condiment made of mangoes, chillies, or capsicum, and lime-juice, with other native fruits, such as tamarinds or ginger-root. The flavour is often heightened by garlic. It is now manufactured for sale in the W., like pickles. Home-made Cs. are often made with various fruits, acids, and spices, tomato flavouring being very common. The chief ingredients generally used are chillies, green ginger, crushed tamarinds, apples, sultana raisins, distilled vinegar, shallots, cayenne pepper, fine salt, garlic, and cucumber. See J. Forbes, *Oriental Memoirs*, II., 1813; and for detailed recipes any modern cookery book.

Chuvashes, or **Tchuwashes**, people of E. Russia, near R. Volga, W. of Kazan, probably of mixed Finnish and Tatar origin, now generally considered of Turkish stock, numbering between 500,000 and 600,000. They are nominally Christians. Their country is an autonomous republic of the R.S.F.S.R., with an area of 18,413 sq. km., and a pop. of nearly 900,000.

Chuyungkuan, customs station in the Nankow Pass, 30 m. N. of Peking, China. It possesses a polyglot inscription.

Chyle, milky-looking fluid passing through the lacteals, which are the vessels which absorb fat from food passing from the smaller intestine. The liquid, which consists of a mixture of these fat globules with the natural juice, passes from the

lacteals into the thoracic duct. **Chyluria** is the passage of C. with the urine. It is commonly caused by the presence of the parasitic *Filaria sanguinis-hominis* in the blood and lymph channels. Where filaria are not present the condition is probably due to a disordered state of the lacteals, the capillary vessels of the small intestine that normally take up the C. Chyme is the pulpy mass into which food is converted in the stomach prior to its separation in the small intestines of the C.

Cialdini, **Enrico** (1811–92), lt. general and politician, who in 1860 won the battle of Castelfidardo. In 1861 he forced Gaeta and Messina to yield, for which services he was created duke of Gaeta.

Ciamician, **Giacomo Luigi** (1857–1922), lt. chemist, b. at Trieste, educated at univ. of Vienna. Assistant at Chemical Institute of Rome, 1880; prof. of general chem., Padua, 1887. From 1889 ordinary prof. of general chem. at Bologna. Senator, 1910. Works include *Organico e fisiologico chimica* (1908); *Fotochimica nell'avenire* (1912).

Clampoli, **Domenico** (1855–1929), lt. writer, b. at Ateza, in the Abruzzi. He was a prof. of literature at Ancona, and has written some stirring novels which represent the life of the natives in the Abruzzi, such as *Conti Abruzzesi* (1880); *Trece Nere* (1882); *Cicula* (1884). Other novels are *L'ignoto* (1883) and *Roccamorina* (1890), besides various works on Slav literature, as the *Melodie Russe* (1881) and *Littérature Slave* (1889–90).

Cianciana, tn. in the prov. of Girgenti, Sicily, which possesses extensive sulphur mines. Pop. 8000.

Ciano, **Galeazzo**, Count (1904–44), lt. Fascist leader, son of a naval officer and ex-president of the Chamber of Deputies. Was in the diplomatic service in S. America and China. Supported the Fascist movement from the beginning; married Edda, daughter of Mussolini, through whom he acquired much of his influence. Under-secretary of state for propaganda, 1934. In the Italo-Ethiopian war he served as an air pilot, commanding a squadron. Foreign minister, 1936. In 1937 he signed the Anti-Comintern Pact (q.v.) on behalf of Italy and also, in 1939, the Italo-Ger. military alliance. He left the Foreign Office in 1943 to become ambas. to the Vatican. In 1944, together with others, he was brought to trial at Verona. Mussolini, though by that time devoid of any real power, wanted to avenge himself on the men who, he supposed, had brought about his downfall, and on Jan. 11, 1944, C. was shot. See M. Mageridge (ed.), *The Ciano Diaries* (1939–43), 1947, and *Ciano's Diplomatic Papers* (1936–42), 1948 (a record of every phase of the Nazi-Soviet friendship as well as of contemporary lt. foreign policy).

Cibber, **Calcy Gabriel** (1630–1700), Dan. sculptor, who came to England and worked at Chatsworth for the fourth earl of Devonshire, under whom he fought for William of Orange, who made him royal carver. His son, Colley C. (q.v.), was the well-known actor and dramatist. His

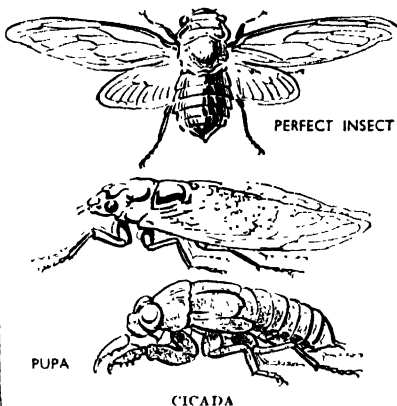
most famous works are the statues of 'Melancholy' and 'Raving Madness,' and the bas-reliefs on the Monument. The Dan. church in Stepney (demolished in 1860), where he was buried, is supposed to have been built by him.

Cibber, Colley (1671-1757), poet laureate, dramatist, and actor, came to London in 1687, and on hearing of the landing of William of Orange, offered himself as a volunteer to Wm. Cavendish, earl of Devonshire. Soon after the revolution, C., being disappointed in his hopes of obtaining a commission in the army, joined the united companies at the Theatre Royal, where he made his first appearance in 1691, and in the following year his first success, in the part of the Chaplain in *The Orphan*, by Otway. In Jan. 1695 his first play, *Love's Last Shift*, or *the Fool in Fashion*, was produced, and it was so successful that Vanbrugh wrote a sequel to it, called *The Relapse*, in which C. scored his first big hit as an actor. He wrote a great number of plays, many of which found appreciative audiences, and played many parts, in pieces by both himself and others. *The Careless Husband* (1704) was, in the opinion of Horace Walpole and others, C.'s best play. C. initiated the reaction from Restoration drama by introducing a moral tone into his comedies; but his heart was with the actors, not with the tragedy and comedy of the outside world, which they might be expected to portray. He was at his best in eccentric comedy, his voice being too thin for any declamatory roles. In 1709 he became a joint proprietor of Drury Lane, and he was the first manager to run a theatre on strictly business lines. After the death of Laurence Eusden in 1730 he was appointed poet laureate, less, as he himself admitted freely, for his literary merits than for his political activities on behalf of the Whigs and in active opposition to the Jacobites. In 1740 he pub. *An Apology for the Life of Mr. Colley Cibber, Comedian*. This work, in the absence of any biography, is the prin. authority for his life. See F. D. Senlor, *The Life and Times of Colley Cibber*, 1928.

Cibber, Susannah Maria (1714-66), wife of Theophilus C., actor, and sister of Dr. Arne, the composer. She started as a singer, and was the original Galatea in Handel's *Aris and Galatea*. Afterwards she became famous as a tragic actress, and played with David Garrick at Drury Lane.

Cicada, genus of hemipterous insects of the sub-order Homoptera; the species usually inhabits tropical countries, America being especially favoured by its presence. These insects vary in size from one to seven inches across, and are remarkable for their longevity and for their song. The male utters a curious sound, by some thought agreeable and by others intensely unpleasant, by means of a peculiar apparatus on the abdominal and metathoracic segments; it was heard by Darwin when he was on the *Beagle* a quarter of a mile from shore, and inspired the saying of the GK. poet Xenarchus: 'Happy the cicadas' lives, for they have

voiceless wives.' *C. tibicen*, the dog-day harvest-fly, is a black and green species which infests N. America in summer, and utters a shrill cry in the noontide hours; *C. septendecim*, the periodical C., is noted as the longest-lived insect, for the perfect creature requires thirteen to seventeen years for its development. The eggs are placed in the slits of twigs by the ovipositor of the female, and the larvæ are always subterranean. They are said to damage roots, and are in process of extinction.



Cicadella, group of hemipterous, homopterous insects, synonymous with the *Cicada ranatra* of Linnaeus. The species are usually small, and leap by means of their hind legs.

Cicatrisation, process of healing over of an ulcer or broken surface in the skin or the mucous membrane, in which process the original surface is replaced by a material of a fibrous texture and resisting in nature. This effectually shelters the portion of flesh which was exposed, but contains no glands or blood vessels which were present in the original tissue.

Ciccio, l'Abate, see SOLIMECA, FRANCESCO.

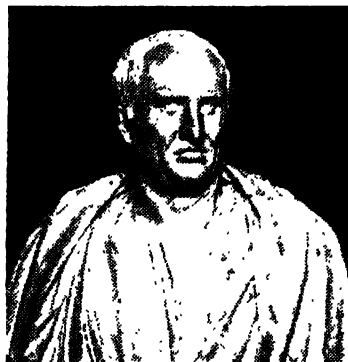
Cicendia, genus of plants in the order Gentianaceae, containing a single species, *C. pusilla*, which grows wild in S. Europe and the Channel Is. *C. fliformis*, the gentianella, a yellow-flowered plant found in damp sandy places of England and Ireland, is now generally referred to the allied genus *Microcala*.

Cicer, genus of leguminous plants, allied to the vetch. The best-known species is *C. arvense*, popularly called the gram or chick-pea (q.v.).

Cicero, Marcus Tullius (106-43 B.C.), Rom. orator and politician, b. at Arpinum, the son of a Rom. knight whose lineage is not known. He spent the greater part of his early life between his native tn. and Rome. As his health prevented him from taking an active part in boyish pursuits he devoted the greater part of

his time to literature. He studied poetry under Archias, was much under the influence of Phædrus the Epicurean, and he studied dialectic under Diodotus the Stoic. Later he went to Rhodes, where he studied rhetoric and law. His literary attempts at this time consisted principally of trans. from the older Grk. writers, some of which have come down to us. He also did his period of military service in accordance with the practice of Rome, and at the age of seventeen saw service during the Social war, in which for some time he served under Sulla, for whom and whose cause he had considerable sympathy. At the age of twenty-five he began his life as an orator. His first speeches are not masterpieces of rhetoric, but he showed no little ability, and one at least of his speeches was recognised as being of considerable merit. For two years C. travelled in the E., still continuing his studies, especially of philosophy and rhetoric, but his travels were made necessary not by his desire to study but by his health. During this period he himself owns that his rhetoric was very much improved, and he returned to Rome at the end of two years with a great many of his previous faults rectified. On his return he married a certain Terentia, a woman who seems to have been noted chiefly for her bad temper, and he became actively engaged in the political life of Rome. He was quaestor in 75, and five years later he prosecuted Galus Verres. C. in this prosecution was simply following the example of all who desired to get on in the state; he is chiefly noted for his defences, but on this occasion, following the usual Rom. practice, he attacked a noted offender. In 66 he was praetor. Two years earlier saw the beginning of his famous letters. These letters give us an extraordinary insight into the hist. and the manners of the time. C. was not yet certain, however, of political support, especially of the senatorial party, and for some time he thought seriously of throwing in his lot with the democratic party, but finally the senatorial party decided to support him, and he remained true to their cause for the rest of his life. In 63 he was consul. He was not, however, well supported by the nobility, who always remembered that he was not the descendant of one of the noble families. His year of office was crowded with events, his chief speeches being those made against Publius Rullus and Catiline. The case of Rabirius Postumus found him deserted by the senatorial party, and since he had rejected the overtures made by Caesar, he was forced into exile. He went into exile in 58, and returned in the following year, but his property had been destroyed by Clodius. He was enthusiastically received, but no return was made to him for his losses. While the breach between Caesar and Pompey was increasing he began to attack Caesar, but he was forced to withdraw these attacks. He accepted financial aid from Caesar, and after this did not actively oppose his actions, but during the period when it became obvious that Caesar and Pompey

must quarrel he devoted himself to literature. In 55 appeared *De Oratore*, in 54 *De Republica*, and *De Legibus* probably in 52. In the latter year he defended Annlus Milo, who was charged with the murder of Clodius, and in the same year he was sent to govern the prov. of Cilicia. He put down sev. risings in that prov. and did his best to alleviate the distress which existed there. In 50 he returned to Rome, but did not enter the city. He found that war was inevitable, and threw



CICERO

A bust in the Capitoline Museum, Rome

in his lot with Pompey, taking, however, no very active part in the war, and finally returning to Rome in 47, on the invitation of Caesar. During the dictatorship of Caesar he refrained from politics, again devoting himself to literature. At this time also he suffered much from domestic troubles; he divorced his wife, Terentia, and married his ward, whom also he shortly afterwards divorced; his greatest trouble, however, was the death of his daughter, Tullia. For some time after Caesar's murder he took no active part in politics, but was gradually drawn into them afterwards. He became the acknowledged leader of the republican party, and relied for safety on the influence which he felt he had over Octavian. In 43, however, he was amongst the proscribed, and on Dec. 7 of that year he was slain. His head was exposed at Rome, and there Fulvia, the wife of Antony and widow of Clodius, thrust a hairpin through his tongue. His chief works, some of which have been lost, are *De Oratore*, *De Republica*, *Brutus*, *Orator*, *Partitiones Orationis*, *Paradoxa*, *Academica*, *De Finibus*, *Tusculanae Disputationes*, *Laus Colonis*, *De Natura Deorum*, *De Divinatione*, *De Fato*, *De Senectute*, *De Amicitia*, *De Officiis*. Among his most notable speeches were the Verrine orations, the defence of Cluentius, the fourteen orations against Mark Antony (the *Philippics*) and the defence of Milo. His political works

include fifty-six speeches all professing to have been delivered in the forum or the curia, though some of them, as, for example, that for Milo and the greater number of the *Philippics*, were written for publication but not actually delivered. C.'s letters, addressed to his brother Quintus, give a day-to-day account of his life and are valuable not only for their historical information but also for the light they throw on the character of C. himself and of his leading contemporaries. Complete works: C. F. W. Muller, G. Friedrich, A. S. Wesenberg, R. Klotz, *Scriptae quae manserunt omnia*, 1869-96. Trans.: J. S. Watson, *Oratory and Orators*, 1891; J. Marthas, *Brutus* (Fr.), 1923; C. D. Yonge, *Academica; De Finibus; Tusculanae Disputationes*, 1865, and *On the Nature of Gods; Divination; Fate; the Republic; the Laws; and Standing for Consulship*, 1871; J. S. Reid, *De Finibus*, 1883; W. Melmoth, *On Old Age and Friendship*, 1773; Sir R. Allison, *On Old Age* (verse), 1916; C. R. Edmonds, *Three Books of Offices*, 1856; G. B. Gardner, *Offices*, 1899; Everyman's Library, *Offices, Essays on Friendship and Old Age, and Select Letters*, 1909; E. S. Schuchburgh, *Letters*, 1899-1900; R. Y. Tyrrell and L. C. Purser, *Letters of Cicero*, 1904-18; W. C. Williams, *Letters to his Friends*, 1927. See also Plutarch's *Lives*; Cardinal Newman, *Historical Sketches* (vol. 1.), 1872-73; A. Trollope, *The Life of Cicero*, 1880; J. L. Strachan-Davidson, *Cicero and the Fall of the Republic*, 1894; W. Warde Fowler, *Social Life at Rome in the Age of Cicero*, 1908; F. R. Cowell, *Cicero and the Roman Republic*, 1918.

Cicero, Marcus Tullius (b. 65 B.C.), only son of Marcus Tullius C., the great orator, and his wife Terentia. In 44 B.C. he joined the republican party and served as military tribune under Brutus in Macedonia; and after the battle of Philippi, 42 B.C., he fled to Sicily, where he joined Sextus Pompeius, but on the conclusion of peace between the latter and the triumvirs in 39 B.C. he returned to Rome. Octavian received him as his colleague in his consulship of 30 B.C.

Cicero, Quintus Tullius (c. 102-43 B.C.), younger brother of Marcus Tullius C. He was *edile* in 67, *praetor* in 62, and for three years *governor* in Asia, where his profligate habits gained him an evil character. He distinguished himself as one of Caesar's officers in Gaul. In the civil war between Pompey and Caesar he joined the former, but later deserted him and reinstated himself with Caesar. He was eventually put to death.

Cicerone, guide, especially for galleries of art or museums or other places of historical interest. The term was first applied in Italy to antiquarians and men of learning, and is supposed to be derived from Cicero as typical of such.

Cicester, see CIRENCESTER.

Cicindelidae, family of coleopterous insects in the section Adephegna, consists of active, voracious, and terrestrial species commonly known as tiger-beetles. Their colouring is generally rich and metallic, and the insects are to be found on sandy

plains or heaths, sometimes on the seashore or the shore of rivers.

Cicisbeo, It. word applied to a gallant who waits upon a married woman. Among the higher ranks of It. society it was formerly the fashion for a C. to be in daily attendance upon the married lady of his choice, who could never be seen in public with her husband. The word is synonymous with *cavaliere servente* and *patito*. It originally meant a knot of ribbons, hanging on to the hilt of a sword or to the handle of a fan.

Cicuta, genus of umbelliferous plants, contains about half a dozen species growing in the N. hemisphere. The best known of these is the water-hemlock or cowbane (*C. virosa*), found occasionally by the sides of ditches and ponds of Britain.

Cid, The, historical and legendary hero of Spain. The legends which have accumulated round his name for a time gave rise to the theory that he was a purely mythical character, but it has since been proved that he existed, although his deeds, great as they were, are not actually identical with those with which he is credited. New research, much of it into Moorish sources, often lend surprising confirmation to the historical accuracy of the *Poema del Mio Cid*. Thus, a recently discovered passage by Ben Allathil not merely confirms the C.'s victory at Cuarte, in Valencia, but describes in detail the strategy ascribed to him in the poem. He was b. during the fourth decade of the eleventh century, of a noble Castilian family. He reached manhood just at the time when Ferdinand died and left his dominions divided amongst his five children. He became a prominent supporter of Sancho of Castile; Spain at this time was equally divided amongst the Moors and the Spaniards. The Moors also, freed from allegiance to the caliphate, were divided up into small and independent states, continually quarrelling amongst themselves as well as with the Spaniards. The Spaniards, moreover, were not in a very united state. The C. plunged into the wars of the period; he won the title of *Campador* by his valour in fighting against Navarre, and he supported Sancho of Castile against his brother Alfonso. Whilst journeying to Seville to collect tribute from one of the subject Moorish rulers, he took part in the fight against the king of Granada, whose forces he was responsible for routing. Returning to Burgos, he found himself the victim of a plot and was forced into exile (c. 1075). After this date the C. became the captain of a free company. He sold his services, now fighting for the Moors, now for the Christians. His valour as a warrior and his capability as a general cannot be doubted, but although he made many attempts to reconcile Alfonso of Castile, his career at this time must be regarded in the light of a mercenary and not a national patriot. He led a successful expedition against Valencia, and for some time ruled over Valencia and Muroia. The Almoravides, whom he had defeated on more than one

occasion, at length rose once more against him, and although he was not personally defeated, his army and chief lieutenant were. In 1099, worn out with war and grief, he died. The city of Valencia held out for yet another three years, and at the end of that time his body was taken to Burgos and there buried. He has been regarded always as the national hero, and within a century of his death legend after legend had sprung up concerning him. Over 200 ballads still exist which have him for their hero, and which ascribe to him all sorts of wonderful and heroic adventures. The poem *El Cid* itself is but a fragment of some nearly 4000 lines. But these lines all form part of a great rugged epic in which the national hero of a national Spain struggles against the Moors. He combines in his person the highest conception of valour and courtesy. He was indeed the greatest of all guerrilla warriors and generals, and perhaps this is the best reason why he should for all time be held up by the Spaniards as the national hero.

There is a translation of the *Cid* by J. Ormsby. See also Cornelle's *Le Cid*, based on a drama by the Sp. poet Guilhem de Castro, and Southey's *Chronicles of the Cid*, 1808; H. Butler Clark's *The Cid Campeador*, 1877, and B. Menéndez Pidal, *La España del Cid*, 1948.

Cider, alcoholic beverage made from the juice of apples. The proportion of alcohol depends on the properties of the fruit employed, the method by which fermentation is carried out, and any subsequent treatment, such as blending with other alcoholic liquors. In England and America C. contains from 2 to 8 per cent of alcohol, but in certain continental Cs. the proportion may be 10 per cent, or even more. C. containing a large proportion of sugar and comparatively little alcohol is known as sweet C., and the term rough is applied to those Cs. containing little sugar and an appreciable amount of bitter extractives and acetic acid. The chief C. dists. of England are the cos. of Hereford, Devon, Somerset, Worcester, Gloucester, and, to a less extent, Kent and Norfolk, with a C. orchard acreage of (1947) 58,000; in Ireland C. is made in cos. Louth, Cork, Waterford, and Tipperary; large quantities are also produced in the U.S.A. and in the N. dists. of France and Germany. The premier C. apple is Kingston Black; others are Yarlington Mill, Foxwhelp, Cap of Liberty, Cheathoy, Bloody Butcher, and Slack-ma-Girdle. The apples used are grown and picked for that purpose, and are usually varieties unsuitable for eating on account of the presence of bitter substances which effectually neutralise the taste of the considerable quantity of sugar. The apples are then crushed in a mill, and the juice is drained from the pulp or pomace. The juice is then placed in casks with large vents and allowed to ferment, a temp. of 55-60° F. being deemed suitable. The casks should be full, in order to give an opportunity of removing the excess yeast as it rises, as this is said to prevent the formation of

acetic acid, which would give too astringent a flavour. The period of fermentation is usually a week to ten days, after which the C. is siphoned into casks; these are stored in a cool place and the C. is re-racked in a few months. The good qualities of C. depend on preventing acetification and producing a moderate amount of alcohol. It should be mellow and pleasantly alcoholic, though in some dists. a certain amount of roughness or astringency is preferred. Its appearance is improved by the use of a fixing to clear the liquid, and alcohol may be added to increase its strength. C. is produced to the extent of many millions of gallons annually in the United Kingdom; it has long been the favourite beverage of the inhab. of fruit-growing dists., and has acquired a reputation as a specific for gout. C. research is carried out at Long Ashton National Fruit and C. Institute. Of recent years in England sev. manufacturers have bottled various forms of apple juice of a tectotal nature under brand names derived from *cider*; these are extremely palatable, and often so closely resemble sweet C. that only an expert could detect the difference.

Ciechanow, tn. in the dist. of Plock, Poland, 55 m. N.W. of Warsaw. Pop. (1939) 12,000.

Ciego de Avila, tn. in the prov. of Camagney, Cuba, with sugar factories. Pop. 16,400.

Cielo Dalcamo, or **Giulio d'Alcamo**, It. poet, b. at Alcamo near Palermo, who lived at the end of the twelfth and beginning of the thirteenth century, and was one of the first to write poetry in It. Of his works only one poem remains, pub. in 1661. This is a spirited dialogue between lover and lady and was translated by Rossetti in *Dante and his Circle*. See Alessandro d'Ancona's works on It. literature, and Gardner's *Italian Literature* in Beun's sixpenny series.

Ciénega, or **San Juan**, tn. in Magdalena, Colombia, near the C. Grande, or lagoon of Santa Marta, from where it is distant 22 m. Pop. 45,400.

Cienfuegos, tn. in Cuba, 42 m. N.E. of Trinidad. It is situated on a fine, sheltered harbour, and is an important seaport of Cuba. It has an active trade in sugar. Pop. 91,800.

Cieszyn, see **TESCHEN**.

Ciezo, tn. in Spain in the prov. of Murcia. It lies in the Segura valley, with mts. on the N., and a fertile plain on the S., which produces grain, wine, olives, and fruit. Pop. 16,000.

Cigala, **Lanfranco** (c. 1218-78), It. poet, b. at Genoa. His poems are concerned principally with political subjects, such as Louis IX. and his crusade. His love poems deal with two Provençal ladies, Adalais de Vidalhana and Salvaia. Thirty only of the poems have been preserved, and these have never been critically ed. In 1241 he was sent by his fellow countrymen to obtain a treaty of peace from Count Raymond Berenguer V. of Provence. Upon his return to his native tn. he was appointed judge, 1243, and in 1278 he was made consul. He is

supposed to have been murdered near Monaco the same year.

Cigar, roll of tobacco leaf for smoking purposes. The prototype of the C. was one of the earliest known forms of smoking, and its use was widespread among the natives of the Americas at the time of Columbus's voyages. The C. was adopted by the Sp. and Portuguese sailors, but although Eng. and other mariners were occasionally seen with crude rolls of tobacco leaf this method of smoking was, to all intents and purposes, confined in the W. world to the

These machines are composed of a bunch-making unit and a wrapping unit, and are manned by two operators. To make a C. the filler, which is the inside or the core of the C., is rolled in a leaf known as the binder or bunch wrapper, and has to be made to the shape, size, and weight of the particular C. Finally this is covered with an outer leaf called the wrapper. The wrapper is the most expensive leaf used in C. manuf., and has to be sound and of good texture and colour. The binder need not have these qualities, and inferior grades and colours can be used, but it is



Imperial Tobacco Co.

CIGARETTE-MAKING MACHINE

Iberian peninsula for almost three centuries, probably owing to the almost universal acceptance of the pipe. The C. was brought to England as a result of the Peninsular war, and in spite of much criticism, gradually ousted the snuff habit which was fashionable at that time. By 1840 the production of Cs. in England was increasing rapidly. Leaf for the Brit. C. industry is obtained from the U.S.A. (particularly Wisconsin, Connecticut, and Pennsylvania), Brazil, Cuba, W. Canada, Jamaica, Brit. N. Borneo, Dominican Republic (San Domingo), and the Dutch F. Indies.

Cs. are produced by three methods: (a) Entirely handmade, which requires the greatest skill and is the most expensive; (b) the mould principle, where the bunches are shaped either by hand or machine, and pressed in wooden moulds, after which the outer wrapper is put on by hand; (c) entirely machine-made.

preferable for it to be sound and of good size. Both wrapper and binder must have good steady burning qualities. For filler the small and broken leaves can be used. The shape, size, and colour of Cs. are indicated on the outside of the C. box. There are many shapes and sizes, and there is no hard and fast rule governing the choice of name to describe them, although certain names have become accepted by common usage. For instance Corona indicates a straight-shaped C. with a rounded top approximately 5½ in. long, while a torpedo shape (i.e. a pointed C. drawn in at both ends) might be called *Imperiale* or *Elegante*. *Panatella* denotes a thin straight C. 5 in. to 6 in. long—the imported varieties being pointed while the Brit. product is usually open at both ends. *Cheroots* vary considerably in size, but are usually straight or very slightly tapered with both ends left open.

The colours or shades of Cs. are denoted

by the following markings: *Claro, light; Colorado claro, medium light; Colorado, medium; Colorado maduro, medium dark; Maduro, dark.*

Cigarette (dimin. of the word *cigar*), small roll of fine-cut tobacco, usually wrapped in thin paper. Cs. were popularised in England by soldiers returning from the Crimean war, and the first Eng. factory was set up at Walworth in 1856. C. smoking has increased steadily, particularly since the First World War, and now provides considerable revenue through heavy tobacco import duties. The most popular Cs. in Great Britain are made from flue-cured Virginia type tobacco. This tobacco originated in the U.S.A., which still produces the finest types, and remains the main source of supply. In recent years Virginia type tobacco has been produced successfully in empire countries, notably Canada, Rhodesia, and India. Turkish Cs. are also manufactured in Great Britain, but their highly distinctive flavour is not generally popular in this country. The term Turkish is loosely applied to cover all oriental tobacco, i.e. tobaccos grown in the Near E., including Turkey, Greece, Cyprus, Syria, and the Balkans. Amers. prefer blended Cs., which are often sweetened with glycerine. Customs regulations in Great Britain forbid the treatment of Cs. in this way. Contrary to widespread belief, saltpetre is never used during manuf. Considerable quantities of Cs. are exported from Great Britain. Cs. were originally made by hand, but hand-making is gradually dying out, having been superseded by modern high-speed machinery. There are two methods of hand-making—rolling by hand and push work, in which the tobacco is filled into a ready-made paper tube. Modern C.-making machines, having been fed with cut tobacco, bobbins containing up to 3 m. of C. paper, printing ink, and paste, can produce perfect Cs. at the rate of 1000 per min. The cut tobacco is fed into a narrow trough housing the C. paper, which runs in an endless stream from the bobbin. A printing device, incorporated in the machine, has meanwhile printed the makers' name and brand name, at C.-length intervals, on the paper. One edge having been gummed, the paper is curled round the tobacco and sealed to form one long C., which is cut into lengths by a rotating knife. Machines are also used for packing cartons and boxes, and electrical devices eject any packet containing an incorrect number of Cs. Many novelty types of C. have been produced—scented Cs., self-lighting Cs., and Cs. in coloured papers—but none have attained popularity.

Cigliano, tn. in prov. of Novara, Piedmont, Italy, 32 m. S.W. of Novara. Pop. 6000.

Cignani, Carlo (1628-1719), It. painter, b. at Bologna; a pupil of Battista Carlo and Francesco Albani, he derived his inspiration from Correggio. His best known work is the 'Assumption of the Virgin,' at Forlì. Others are 'Entry of Paul III. into Bologna'; 'Francis I.

touching for King's Evil'; 'Power of Love,' painted on the wall of the palace at Parma; and 'Adam and Eve,' at The Hague.

Cignaroli, Giovanni Bettino (1706-70), It. painter, who in 1769 became director of the academy at Verona. He belonged to the late Venetian school.

Cigoli, Lodovico Cardì da (1559-1613), It. painter, architect, and poet, b. at Cigoli, in Tuscany. He was a pupil of Alessandro Allori and Santi di Tito, but he followed the great Florentine painters and especially Correggio, being known as the Florentine Correggio. His 'Ecce Homo,' which gained a prize against Passignani and Caravaggio, was taken to France by Napoleon, but restored to Florence in 1815. His paintings include 'St. Peter healing the Lame Man,' in St. Peter's at Rome; 'Conversion of St. Paul,' in the church of San Paolo fuori le Mura; 'Story of Psyche,' in fresco at the Villa Borghese; and a 'Martyrdom of Stephen.'

Cilia are minute, fine-hair-like protoplasmic processes attached to one or both ends or the sides of some bacilli, by means of which they propel themselves. Bacilli possessing them are termed motile. Cells with C. attached also line some parts of many-coiled animals.

Ciliata, div. of the Protozoa, composed of the infusorians which have a mouth and anus, move and feed by means of cilia, and usually possess undulating membranes near the mouth, membranelles and cirri. The body is nearly always surrounded by a thin layer of cuticle, contains many nuclei and sev. contractile vacuoles. Reproduction is generally by means of div.

Cilicia, dist. of Asia Minor, along the S. coast between Syria and Pamphylia, which before the First World War, was included in the Turkish vilayet of Adana. In ant. geography it included the valley of Adana and Tarsus, bounded by the Mediterranean on the S., Mt. Taurus on the N., and Amanus on the E. It was part of the Persian Empire until Alexander's conquest, 331 B.C. At his death it fell to Ptolemaic rule and later to the Seleucids. The inhab. of the mountainous dists. became famous pirates. In 64 B.C. it was subdued by Pompey and made Rom. ter. It formed part of the Ottoman Empire in 1515. In 1833 it was ruled from Cairo, but was evacuated by Mehmet in 1840, and given back to the Turks. It is now included in the vilayet of Adana (Seyhan) in Turkish Asia Minor. Only ruins remain of its two great tns., Tarsus and Soli, once centres of Gk. civilisation. C. was occupied by Gen. Allenby's troops in the First World War soon after the armistice of Oct. 31, 1918, was signed with the Turkish commander-in-chief, the object of the occupation being the protection of the Bagdad railway (q.v.). By the treaty of Sèvres (q.v.) part of C. was granted to France, but in 1921, after serious conflict with the Nationalist forces, France abandoned all claim to the dist. The products of the dist. include corn, wool, and sesame.

Cilician Gates (Ghulek Boghaz), narrow

pass over the Taurus range in Asia Minor. The great highway led from the W., on a long rough descent from the central plateau, to the valley of Adana and Tarsus. At the gates themselves the width of the road is 25 ft.

Cilli Celje, tn. in Yugoslavia, lies picturesquely on the l. b. of the Sann, having remains of anct. walls and towers. It was besieged by the Turks in 1492. Pop. 8000.

Cima, Giovanni Battista, called Cima da Conegliano (c. 1460-1518), It. painter. His work resembles that of Giovanni Bellini, of whom he is believed to have been a pupil, and consists of landscapes, altar-pieces, scenes with architectural backgrounds, and a few classical pictures. In various churches at Venice are to be found his 'Saint John the Baptist'; 'Saint James and Saint Nicholas'; and 'Saint Thomas touching the Wounds of Christ.' Other of his works are at Milan, Munich, and Dresden. In the Louvre is his 'Virgin and the Child Jesus,' and in the National Gallery, London, are some panels.

Cimabue, Giovanni (1240-c. 1302), It. painter, b. in Florence, the family name being Gualtieri. Tradition credits him with being the greatest artist of his time, but much of the work attributed to him is not authenticated. His influence on the art of the period resulted from his attempt to get away from the severity of the earlier It. painters and to introduce a softer yet more virile style, which later developed in his pupil Giotto, whom he is supposed to have found as a child drawing on a slate with a piece of coal, and brought to Florence to teach. His most famous painting is a 'Madonna and Child with Angels,' which forms the altar-piece of the chapel of the Rucellai in Santa Maria Novella, Florence, but, according to some, this work has been proved to be by Duccio. Other Madonnas are to be found in the Academy of Arts at Florence and at the Louvre. He is also credited with some frescoes in the church of San Francesco, Pisa; his most famous work is a mosaic in the cathedral at Pisa, 'Christ in Glory between the Virgin and John the Evangelist.' He is buried in the cathedral at Florence. See T. Cole and W. J. Stillman, *Old Italian Masters*, 1892; Julia Cartwright (Mrs. Ady), *Painters of Florence*, 1901.

Cimarosa, Domenico (1749-1801), It. musical composer, b. at Aversa, Naples. His first comic opera, *Le Stravaganze del Conte*, composed when he was twenty-three, was a great success. His opera bouffe, *Il Matrimonio segreto* (Vienna, 1792), is sometimes still performed. His serious opera, *Gli Orazi*, ed. i *Curiazi*, like much of his light-hearted comedy, is in a style which has earned him the sobriquet of 'the Italian Mozart.'

Cimbex, genus of hymenopterous insects in the sawfly family, Tenthredinidae. The species are often larger than bees, although most of the other members of the family are small and inconspicuous. The larvae are often very destructive to vegetable life, e.g. *C. americana*, which is known to destroy large elm-trees.

Cimbri, or Kimbri, anct. people whose original home and location have been a matter of much dispute, but they are now generally believed to have belonged to the Teutonic race. Pliny writes of the peninsula of Jutland as the Cimbric Chersonese; Pomponius Mela that the C. and Teutones lived on the Sinus Codanus, i.e. the S.W. corner of the Baltic. In Ptolemy's map Jutland is also marked as the Cimbric Chersonese. They may probably be traced to the prov. of Aalborg in Jutland, which was earlier known as Himmerland, a name which may be connected with C. Former authorities who believed they were Celts pointed to Cymry, the Welsh. The C. were certainly the first Teutonic people the Romans encountered; at the end of the second century B.C. they invaded Gaul, Illyria, and Italy, driven, as it was believed, from their home by inundations of the sea. They wandered about the Danube for some time, fighting with the various Celtic tribes settled there. In 113 B.C. they first appear in Rom. hist., when the consul Cn. Papirius Carbo was defeated by them at Noreia (Carinthia). They demanded land, which was refused. They then moved W., and in 109 B.C. defeated the consul M. Junius Silanus in the S. of Gaul. In 105, led by their king Bolorix, they annihilated the Rom. army under Cn. Mallius Maximus and Cæpio at Arausio (Orange). Turning off towards Spain, they were driven back, and in 103 overran Gaul as far as the Seine, where the resistance of the Belgæ forced them S. once more. They were now reinforced by the Teutones, and moved S. with the intention of invading Italy and conquering Rome. They divided their forces; the Teutones to take the W., the C. the E. passage of the Alps. At Aquæ Sextiæ (Aix), 18 m. N. of Marseilles, Caius Marius, the Rom. consul, inflicted a total and crushing defeat on the Teutones, 102 B.C. The C. had passed the Alps to the E., and had forced the other Rom. army under Lutatius Catulus beyond the Adige and the Po. Marius followed up his victory over the Teutones by a still more crushing blow upon the C. on the Raudine plain, near Vercellæ, annihilating their forces and slaying their king Bolorix. By these two victories Marius saved Rome from a disaster probably as great as that inflicted on her by the Gauls at the Alia in 390 B.C.

Cimicidæ, small family of hemipterous insects, in the section Heteroptera, is represented in most lands where civilization is predominant. The insects are parasitic on various vertebrates, such as men and birds, but are in turn preyed on by larger insects. The chief genus is *Cimex*, which contains few species, and none with which mankind would not gladly dispense. *Cimex lectularius* is the bed-bug. See BUG.

Cimicifuga, genus of ranunculaceous plants, consists of perennial herbs with divided leaves and racemes of whitish flowers; the roots act as drastic purgatives, and are poisonous.

Cimiez (anct. Civitas Cemenellensis), residential quarter 2½ m. from Nice, S.

France, with many fine hotels and villas. A favourite resort of Queen Victoria.

Ciminnna, tn. in Sicily, 20 m. S.E. of Palermo. Pop. 6500.

Cimmerii, name of an anct. people of the far W. of Europe, first mentioned by Homer, and living on the banks of a stream in darkness and mist (*Odyssey*, xl. 14). They are talked of by Herodotus in his account of Scythia, who says they were the early inhab. of S. Russia, compelled by the Scyths to flee into Asia Minor, where they dwelt for about a century. About 650 B.C. they invaded Lydia, destroyed Sardis and Magnesia, and between 605 and 556 B.C. were entirely defeated by Alyattes, king of Lydia. They have been identified with the Cimbrri of Jutland, but only on account of similarity in name.

Cimolite, variety of clay (hydrrous aluminium silicate), which is used as fuller's earth, that is, to absorb grease and oil from cloth. See also under FULLER'S EARTH.

Cimon (c. 507-449 B.C.), celebrated Athenian general, was the son of the great Miltiades and Hegesipyle. He distinguished himself by his valour in the Persian wars, and was, with Aristides, put in command of the Gk. fleet sent to Asia against the Persians. He was later in sole command of the Gk. naval forces, and conquered the Isle of Scyros in 470 B.C. He achieved a dual triumph in 466, defeating the Persian fleet off the R. Eurymedon in Pamphylia, and later in the same day winning a battle on the land. He was for some time one of the most prominent members of the aristocratic party in Athens; in pursuance of his policy of friendliness to Sparta, he led an Athenian force to aid them when the helots revolted in 462 B.C. The Spartans, however, dismissed with scorn his proffered aid, and the Athenians in anger ostracised him in the following year on a pretext of corruption. He was recalled in 457 (or 451), and he defeated the Persians off the coast of Cyprus; the victory was due to him, but he d. before the engagement.

Cinchona, genus of Rubiaceæ, consists of about forty species which are indigenous to the E. slopes of the Andes, but are also cultivated in Java, S. India, and the E. Indies. The trees belonging to this genus vary very much in size, have evergreen leaves, and flowers in panicles, white or pink in colour. The useful part of these trees is their bark, from which quinine is manufactured, this medicine first being used by the countess of Chinchon, wife of the ruler of Peru, to cure a fever, about the year 1638. After this it was taken to various places in Europe by the Jesuits, and obtained the name of Jesuits' bark. The work of obtaining the bark of these trees is carried on by Indians, who have to make their way through thick forests to the trees. The latter are detached from any vegetation growing round the stem, and after having been felled as near the root as possible, have their bark cut off from both the main stem and the branches. It is then dried and packed, the thinner bark of the

branches curling up to form quills. This method, however, was seen to be very expensive, and was leading to the extermination of the trees. Accordingly, plantations were tried in other parts, especially Algeria, Java, the Himalayas, and Ceylon. Cinchonidine, cinchonine, and other alkaloids are obtained from the bark in addition to quinine.

Cinchona Bark Alkaloids. The term alkaloid (i.e. like an alkali) is applied to certain basic substances derived from plants and chemically related to pyridine, quinone, etc. They are generally of considerable physiological potency and many are valuable drugs. Sev. distinct members of the group have been obtained from C. B., the most important being *quinine*, $C_{20}H_{21}O_4N$, and *cinchonine*, $C_{21}H_{23}ON_3$, together with *quinidine*, an isomeride (see ISOMERISM) of quinine, and *cinchonidine*, an isomeride of cinchonine. Quinine, which is a specific for malaria and an excellent febrifuge, is a white crystalline solid melting at $177^\circ C$. It readily forms salts, e.g. quinine sulphate, and these salts are usually preferred in medicine to the alkaloid itself. Ammoniated tincture of quinine is a solution of quinine sulphate in a mixture of water and alcohol to which a little ammonia has been added. Cinchonine is very similar in constitution to quinine, but a solution of its sulphate does not show the characteristic fluorescence of quinine sulphate solutions. The structure of the C. B. A. has been solved only recently, and so far it has not been possible to make them synthetically. Similar compounds, however, such as mepacrin (Ger. Atobrin) have been artificially prepared in the laboratory.

Cinchonine ($C_{21}H_{23}ON_3$), alkaloid prepared from cinchona, the bark of certain trees grown in S. America and the E. and W. Indies. Cinchona contains five alkaloids, quinine, quinidine, C, cinchonidine, and conquinamine, of which C. and cinchonidine are isomeric. C. is similar to quinine in its effect upon the malaria parasite, but is not so active. It also has a tendency to produce convulsive movements in certain patients, which renders it advisable that quinine preparations should be free from C. C. is a colourless crystalline body, insoluble in water. The sulphate is dissolved with difficulty in pure water, but is soluble in acidulated water.

Cinchovatine, or **Arisine** ($C_{23}H_{25}O_4N_3$), crystalline alkaloid obtained from the *Cinchona ovata*. It occurs with the alkaloid cusconine in *Cusco Cinchona* bark. The crystals are white and prismatic.

Cincinnati, second largest city of Ohio, U.S.A., situated on the N. bank of the Ohio R., 270 m. to the S.E. of Chicago. Five bridges and sev. ferries are the means of communication with Covington and Newport on the opposite side of the riv.; there are lines of steamers from Pittsburgh and New Orleans. The land near the riv. is low-lying and level; this portion of the city is occupied by the commercial buildings. The residential part is on the

bluffs which are situated around the valley. There are a number of fine buildings, of which perhaps the best is the Rom. Catholic cathedral of St. Peter's, which contains the 'St. Peter Delivered' by Murillo. Among other noteworthy examples of architectural art are the U.S. gov. buildings, Masonic Temple, Chamber of Commerce, Odd-fellows' Hall, Mechanics' Institution, the opera house, the city hall, co. court-house, the United Bank building, and the forty-storey skyscraper in Fountain Square. The educational institutions of the city include the univ. of C., a Jewish, a Wesleyan, and two Jesuit colleges, the Mechanics' Institution of Ohio, a theological seminary, two medical colleges, and an art school. Its cultural institutions also include the Conservatory of Music, the Museum of Art, and the Academy of Art. Recreation is well provided for by ninety-five parks, of which the finest are Eden Park, situated to the E. of the city, and Burnet-Woods Park. There is a zoological garden. The municipal library contains 700,000 vols. C. is a commercial centre of the first rank, and its manufs. are varied and important. Among them may be mentioned the manuf. of machine tools, paper, paints, wholesale meat packing, vehicle bodies and parts, men's clothing, petroleum refining, soap, steel works, rolling mill products, and a large printing and publishing industry. It is the centre of the Amer. radio industry. It has air-lines to Chicago, Detroit, etc. Eighteen railway lines meet here. It is the terminus of the great Mississippi steamers. Harriet Beecher Stowe lived here from 1832 to 1850, and many fugitive slaves were aided in C. homes in their flight to liberty. C. was founded in 1788 by a trader chasing Indian horse-stealers down the R. Ohio. He bought 10,000 ac. of land at a dollar an acre. Fifty years later refugees from Prussia discovered that grapes grew abundantly in its vicinity, and it became a chief wine-producing centre, and then for a time Porkopolis, because of its huge pig industry. Since 1924 it has been governed by a city manager with a council of nine elected by proportional representation. It is the only city in the world which, out of its own resources, built a railway system, the C. Southern, which for many years has been leased by the municipality to one of the big trunk lines. The pop. was, in 1940, 453,000, of whom nearly one-half are said to have been of Ger. descent.

Cincinnatus, Lucius Quinticius, one of the earliest and most typical of the Rom. heroes, was b. about 519 B.C. The legend runs that in 485 B.C., when the Rom. army had been cut off by the Aequians, he was called from his plough to become dictator. He overcame the enemy, and after serving the republic, returned to his farm. He was again made dictator in 439 B.C., this time in order to avert, if possible, civil war in Rome. Rivalry was high between the patricians and the plebeians; C. checked the disorder, and caused Spurius Maelius, who was sus-

pected of conspiring to become king, to be executed.

Cincius, Lucius Alimentus, Rom. historian who flourished in the third century B.C. Very little is known of his life beyond the fact that he took part in the second Punic war, and was taken prisoner by Hannibal, who treated him with courtesy. He wrote works dealing with Hannibal and with Gorgias of Leontium, of which only fragments remain.

Cinder-bed, name of a stratum of the Middle Purbeck series of the Jurassic system, so called by the quarrymen of the dist., and composed chiefly of the aggregated shells of an oyster.

Cineas, Thessalian, chief adviser and minister of Pyrrhus, king of Epirus. He studied oratory in Athens, and was known as the ablest and most eloquent man of his time. In 280 B.C., after the defeat of the Romans at Heraclea, he was sent on a mission of peace to Rome. The terms were rejected through the agency of Appius Claudius Cæcus, the censor, but on being sent again in two years' time, with easier terms, induced the senate to accept his proposals of peace.

Cinematograph, apparatus for projecting on to a screen in rapid succession a series of images or pictures representing successive stages of appearances involving motion, thus producing the effect of a continuously moving picture which accurately re-creates the normal movement of the people or objects photographed. The principle of moving pictures was first introduced as a toy, consisting of a number of pictures representing successive stages of some simple movement bound together in book form, the pages of which were released quickly by the thumb. In 1833 the zoetrope, or 'wheel of life,' was introduced. This was a hollow cylinder in the sides of which were vertical slots at regular intervals. It revolved on a vertical axis, and the pictures, on strips, were arranged round the inside, and viewed through the slots as the cylinder revolved, and they appeared to come to life. Machines basically similar which have contributed to the evolution of the present-day film camera and projector were the kinesiograph, nutograph, mutoscope, biograph, and bioscope, all of which produced what were variously called 'living,' 'moving,' and 'animated' pictures. The mechanical operation is to project, highly enlarged, a single picture on to a screen for a small fraction of a second which is instantly followed by a similarly short interval of blackness, and then the next picture, and so on, at great speed. As each picture persists on the retina for an appreciable time after it has been withdrawn, it follows that if the intervals are brief enough, they become imperceptible, and the spectator receives an impression of continuous movement. Silent films used to be photographed and projected at the rate of sixteen frames a second. The modern talking or sound film is photographed and projected at the increased speed of

twenty-four frames a second. This results in 90 ft. of film being projected a minute. In 1877 E. Maybridge obtained a rapid succession of photographic pictures by means of a row of cameras with shutters electrically controlled so as to admit of the snapshotting of the successive movements of a horse. In 1890 E. G. Marey used a celluloid film to take successive photographs, and in the same year Edison contrived a machine to

onespool through a gate behind the lens and on to a second spool. At a speed invisible to the eye a revolving shutter blacks out the image which passes through the lens on to the film, thus dividing the successive images into frames. When the complete roll of negative has been exposed, it is unloaded in a dark room and dispatched to a laboratory to be automatically developed. A positive print is then made. Such first prints from negatives



Edwin S. Porter

BOTH SIDES OF THE CAMERA

Director, behind whom are grouped his technical assistants, leans forward to direct two actors in the film *The Loves of Joanna Godden*.

reproduce the appearance of the movements depicted by such photographs. In London in 1896 a film of the Derby was shown at the Alhambra by means of an Animatograph invented some years earlier by Friese Green and Robert Paul.

C. negative film consists of sensitised gelatin mounted on a strip of celluloid about one inch wide. It is usually obtained in rolls of 1000 ft. for use in cameras employed in studios, and in rolls of 200 ft. for use in portable cameras used on locations unrelated to studios. Studio cameras are electrically driven, whilst portable cameras are usually driven by clockwork or by electric batteries. All modern cameras, however, irrespective of size or type, are geared to run film at the aforementioned rate of twenty-four pictures per second. The film is driven from

are termed 'rushes,' and are viewed by the producer as soon as possible to check results. Professional productions are made on standard size film, which is 35 mm., whilst educational and amateur films are made on sub-standard size film—16 mm. and 9.5 mm.—and are non-inflammable. Standard size films are highly inflammable, and so the projection box in a cinema is fireproof, fitted with two exits, and iron shutters to cover the apertures in the wall through which the film is projected on to the screen. Until the thirties films were silent, their action and stories being explained by captions, and the cinema programme being accompanied by an orchestra. With the birth of the talking film, both the technique of production and the character of the cinema programme were revolutionised,

for each film supplies its own dialogue or music (or both), thus making orchestral accompaniment unnecessary. Many experiments were carried out before perfect synchronisation between the pictures and their corresponding sounds or dialogue was achieved. Ultimately consistent perfection was obtained by driving the camera taking the pictures, and the instrument recording the sounds and dialogue occurring in those pictures, *from the same source of electric power*, so that the speed of both would be identical and constant. Just as the picture camera is loaded with film which photographs people and scenes, so the recording instrument can be likened to a second camera through which film passes at the same speed, photographing all the sounds and spoken words uttered by the people in a scene. The film in this case is called recording stock and is developed and printed in just the same way as is the negative exposed in the picture camera.

The recording camera is connected to a microphone through which all sounds pass, and they create sound waves which are photographed, resulting in a sound track. At the commencement of each scene clapper boards are placed in front of the picture camera bearing the scene number. The clappers are swung together, making a sharp report which is recorded through the microphone on to the sound track, where it registers as a jagged peak. The action of the clappers coming together is simultaneously photographed by the picture camera, and consequently when the positive print of the clappers meeting is placed against the jagged peak in the sound track created by the clapper report, picture and sound will synchronise. Throughout the editing stage the picture film and the corresponding sound track remain entirely separate, and remain so until editing is completed, otherwise pictorial and sound adjustments could not be made. When an entire film has been finished, consisting of hundreds of separate strips of film, each presenting a different scene or a different angle of the same scene, and the corresponding sound track, then the original negative, up till now untouched (for only the positive print is edited), is cut to match the finally edited film, and only when negative cutting has been completed is a combined print made, when, for the first time, the sound track and the picture are printed on the same film. It is in this form that the film is projected in the cinema.

The production of a feature film is carried out by a team of highly skilled technicians, grouped into different departments, and co-ordinated by the director, who is responsible for the results. The chief technicians are the lighting cameraman, the recorder, the art director, and the editor, each aided by technical assistants. In control of a studio which may be making three, four, or more films simultaneously, each with its own director, is the producer, who is finally responsible to the company for all productions. Whereas each film is being made by a

director, all the directors are responsible to the producer. A feature film may take from two to six months to complete. The star system has been more highly developed in America than elsewhere, with the result that American film stars are literally world famous, and vast numbers of cinema-goers go to see their favourite stars irrespective of the subject-matter of the films in which they appear.

Films may be broadly divided into two main categories—features and shorts, most of the former being fictional and most of the latter being factual, covering documentary production and newsreels. The majority of cinema programmes in America and Britain consist of two feature films divided by a newsreel and perhaps a short travel or interest film. This is known as the double-feature programme. Some years ago, however, only one feature was shown, supported by a wide assortment of short films. It is thought that the single-feature programme will be reverted to in the future owing to the shortage of dollars. Should this occur short films will reappear in the cinema from which they have been almost absent owing to lack of programme space because of the above-mentioned double-feature programme. There are two main channels through which films are exhibited: *the theatrical* or ordinary cinema exhibition for providing entertainment and the *non-theatrical*, which covers the distribution and exhibition of films of an informative and instructional character to audiences unrelated to cinemas, as in clubs, institutes, factories, colleges. Non-theatrical shows are given on sub-standard size film, 16 mm. The non-theatrical film show developed enormously during the Second World War in all countries, and the governments of the belligerent nations organised regular propaganda film shows to keep their respective populations informed on all vital matters. In Britain documentary film producers were employed by the government to make great numbers of such films which circulated in many parts of the world. British documentalists excel in the production of such short films, and the non-theatrical system of distribution has given them the opportunity denied them by the double-feature cinema programme of obtaining large audiences. Since 1945, non-theatrical showings have continued, and plans are laid for such films to play a permanent part in the government's informational services. By this means special films are made for farmers, scientists, doctors, and students training for most professions and trades. Similarly the 16-mm. film is being employed increasingly for educational purposes in schools, and this visual method of teaching will, in due course, supersede many existing methods, for film is without equal for demonstrating and explaining processes, and bringing distant parts of the world to the classroom. The British Film Institute serves as a link between the commercial film industry and the educational or non-theatrical film world, and records the

hist. of the industry, and possesses a library of all films which are important enough to preserve for future reference.

From being regarded as a mere toy, and an interesting novelty, film has grown into perhaps the greatest influence in our midst to-day, not only as the most popular form of entertainment for millions, but as a medium without equal for widening the experience of people of all types and nationalities. Whilst the technical side of film-making has made rapid progress, subject-matter of many films remains unworthy of all the technical skill devoted to their production. A great many film stories are adapted from novels and plays, not necessarily because they lend themselves to presentation on the screen, but because their titles or the names of their authors are famous. Thus film depends largely upon other media for its material. When it presents material especially created for it, it will rank as an independent medium of expression, side by side with the legitimate stage, and the novel. The unique ability of film to present all parts of the actual world on the screen to serve as backgrounds for its dramas and comedies will eventually be taken full advantage of, thus enabling film to present material fundamentally different to that which is presented by stage and book.

Development of the Film and Film Acting.—Actuality films and topical events, filmed often from studio reconstructions, were the mainstay of the C. for public exhibition in its early days. Pioneer work in this direction is associated with the names of Leon Gaumont, Charles Pathe, and Georges Méliès in France, Edison, Edwin Porter, and Carl Laemmle in the U.S.A., and in Great Britain Cecil Hepworth, J. Williamson, R. W. Paul, and Bennett Stanford, who made films of the S. African war. Louis and Auguste Lumière, inventors of the first projection machine (1895), made films from scenes from home life, and in these members of their own families took part. Professional actors and actresses of the stage at first looked askance at the new medium. Dramas soon found a place on the screen; an early example was *The Life of Charles Peace*, made by the Sheffield Photo Company in 1905. Historical dramas came into fashion. *Quo Vadis?* (1913), an It. film, was a spectacular achievement which influenced the development of the feature film in America. Great stage celebrities began to make their appearance on the screen, Mlle Réjane in a film version of *Madame Sans-têche* (1911) and Sarah Bernhardt in *Queen Elizabeth* (1912), a film which the Amer. promoter Adolphe Zukor imported into America, and which helped to establish the feature film there. The film 'vamp' was created at this time by Madeleine Roch of the Comédie Française in *Femme Fatale* (1912).

In the U.S.A. the 'star' system came into being as a result of the struggle for the control of the C. industry between a number of independent producers and a combined trust which was attempting to

secure a monopoly of production and distribution. The independents, one of the chief among them being Carl Laemmle, sought to gain publicity by using the names and personalities of their actors and actresses. Thus Florence Lawrence became one of the first of the 'stars.' Until launched by Laemmle, she had been known only anonymously as the 'Biograph girl' when working for the Biograph studio within the Trust. Similarly, 'little Mary' who had been discovered by D. W. Griffith in 1909 in *The Violin Maker of Cremona*, subsequently became famous as Mary Pickford. George Anderson, King Baggott, John Bunny, Marguerite Snow were other actors who achieved early stardom at the hands of the independents. George Anderson in particular, known as 'Broncho Bill,' W. S. Hart, and Tom Mix, who had been a cowboy in Oklahoma before taking to films, became world famous for their cowboy films which thereafter were an outstanding characteristic of Amer. films.

It was in comedy that the film before the First World War had its most promising developments. France led the way, with the trick comedies of Méliès, and then with the comedians Dranem and Prince, the latter in the successful *Rigadin the Clown* Series. A better-known figure was Max Linder who began a tradition of screen comedy in which Charlie Chaplin also made his name. Chaplin's first film, *Kid's Auto-Races*, was made for Keystone in 1913. He owed a good deal to the example of Mack Sennett, the hero of the celebrated Keystone comedies, as did other Keystone artists, Mabel Normand, 'Fatty' Arbuckle, Mack Swain, as well as later comedians such as Buster Keaton, Harold Lloyd, and W. C. Fields. It was while working for Keystone that Chaplin developed the character of the little man with the moustache and the baggy trousers who became world famous.

The pre-eminent figure in the development of the film during the First World War was David Wark Griffith. He was one of the first directors to make films of more than one reel. His first film to become known internationally was *The Birth of a Nation* (1915), followed by *Intolerance* (1916). The photographic quality and the masterly production, exemplified by the handling of great crowds, and the introduction of the close-up to give emphasis to incidents and facial expressions, the development of the flash-back and the fade-out, all mark the work of Griffith as amongst the greatest in the annals of film production. With him were associated a number of celebrated players. Mary Pickford has already been mentioned. Others are Dorothy and Lillian Gish, Henry Walthall, and Douglas Fairbanks, who later developed his clever brand of debonair, dare-devil adventure. Lillian Gish and Mae Marsh were the stars of *Intolerance*, a masterpiece which was to influence the work of the great Russian director, Eisenstein. During the early years of the First World War the serial film enjoyed popularity both in Europe and America, notably *The Exploits of*

Elaine with Pearl White. The film, particularly in America, soon became more sophisticated. The winning innocence of Mary Pickford's characters gave way to the screen 'vanip,' personified in 1915 by the Amer. actress, Theda Bara. Heroines became complex emotional personages, and were portrayed by a succession of popular actresses, Norma Talmadge, Pauline Frederick, Alla Nazimova, and Greta Garbo in Amer. films, Pola Negri in Ger. (later also in Amer.), and Raquel Meller in Fr. Greta Garbo, who was to become renowned for her portrayal of great heroines of hist. and fiction: Queen Christina, Anna Karenina, and Canille, first appeared at the age of seventeen in the Swedsh film *The Story of Gosta Berling* (1923), directed by Mauritz Stiller, who later brought her to Hollywood. The major films of this period were based on 'sex appeal,' a phrase coined at the time and credited to the Amer. director, Cecil DeMille. DeMille had won international fame in 1915 with his film *The Cheat*, with Fanny Ward and the Jap. actor Sessue Hayakawa. Gloria Swanson and Thomas Meighan also appeared in films made by him, notably *Male and Female*, based on Sir James Barrie's *The Admirable Crichton*. DeMille's high society films had a strong effect on manners, morals, and on dress. His heroines became leaders of fashion, and from that time costume designers for the C. have had to exercise the greatest care not only towards the creation of new fashions but to ensure that their designs are not outmoded by the time the film reaches the public. Less of a popular success than DeMille but perhaps more powerful as an influence on the film was the Austrian actor Erich von Stroheim, who directed and acted in a number of realistic films made by him in the U.S.A., notably *Blind Husbands* (1919) and *Greed* (1923) with Gibson Gowland and Zasu Pitts.

The Amer. film industry was at this time enjoying great prosperity. Hollywood attracted many outstanding directors, actors, and actresses from Europe. Among them, besides Greta Garbo and Pola Negri, were Emil Jannings, Lars Hanson, and Conrad Veidt, who had made his name in the famous Ger. expressionist film *The Cabinet of Dr. Caligari*, directed by Robert Wlene in 1919 on the subject of insanity. Stardom in the U.S.A. was at its height. To the names already mentioned may be added those of Richard Barthelmess, John Gilbert, Richard Dix, John Barrymore, Constance Talmadge, and Adolphe Menjou. Menjou had been a success with *Edna Purviance* in *A Woman of Paris* (1923), a film directed by Chaplin but in which he himself only made a brief appearance. Edna Purviance also appeared with Chaplin in *Shoulder Arms* (1918), and *The Kid* (1920). Rudolph Valentino became the idol of the 'fans' in *The Four Horsemen of the Apocalypse* (1921), and *Monsieur Beaucaire* (1924), the latter made by Sydney Olcott, a celebrated director who rivalled Griffith. Olcott was responsible for the

spectacular *Ben Hur* in 1909. A film of the same title in 1928 became perhaps the most popular achievement of the silent film after the First World War. It made Ramon Novarro a star, the equal of Valentino. Another eminent recruit to Hollywood from Europe was Ernst Lubitsch, who made his name in Germany in 1920 with the production of *Madame Du Barry*, entitled *Passion* in the U.S.A., and starring Pola Negri. His Amer. films begin with Mary Pickford in *Rosita* (1923), Pola Negri in *Forbidden Paradise* (1924), Emil Jannings in *The Patriot* (1926), and continue well into the talkie era with the musical play *Monte Carlo* (1930), with Jeanette MacDonald. Later films of his include *Bluebeard's Eighth Wife* (1938), with Gary Cooper and Claudette Colbert and *Ninotchka* (1939), with Greta Garbo.

Outside the U.S.A. film production in the twenties was being developed, particularly in Germany, on ambitious, decorative, and highly dramatic lines, exemplified by *Siegfried* made by Fritz Lang in 1923. Russia was employing film for propaganda purposes—to tell to her millions the story of the revolution. The early Russian silent films, *The Battleship Potemkin*, made by S. M. Eisenstein in 1925, and *The End of St. Petersburg*, made in 1927 by V. I. Pudovkin, were unsurpassed, and made the fullest use of film to create powerful drama by the use of impressive camera angles, and by skilful editing. In 1928 appeared the great Fr. production, *La Passion de Jeanne d'Arc*, regarded as one of the finest of the early historic films, and in the same year the genius of René Clair was revealed in the whimsical comedy, *The Italian Strain Hat*. Excellent pioneer work in the documentary field had been done by the Amer. producer and explorer, Robert Flaherty, who took the camera to the Eskimos for *Nanook of the North* (1922), and to the S. Sea islands for *Moana* (1926). He later himself contributed to the Brit. documentary movement with *Men of Aran* (1934). Meanwhile, under Grierson's leadership, a number of Brit. directors as well as the Fr. director, Alberto Cavalcanti, were producing notable work with the G.P.O. Film Unit and other organisations which provided opportunities for documentary. In this connection mention must be made of the series of Brit. 'shorts' which achieved world-wide popularity in silent form and which were continued successfully as sound films—namely *The Secrets of Nature* series made by Bruce Wolfe, Percy Smith, Mary Field and others, and the *Cinemazine* edited by Andrew Buchanan.

To return to the feature film, the story and the style of acting underwent considerable change in the years immediately preceding the talkies. This was mainly through the influence of the Russian directors, Eisenstein, Pudovkin, and Dovzhenko. More attention was paid to character and to a more natural style of acting. This was made possible by the introduction of the panchromatic film

in 1925, which needed less light and less distortion of natural tone values. The development of silent film technique was, however, halted by the coming of the talkies in 1927. The first feature film with synchronised sound including speech, song, and music, was *The Jazz Singer*, produced by Warner Brothers with Al Jolson on Oct. 6, 1927. From that time talkies became the rage. The reputations of many actors and actresses made in silent films were lost, others were consolidated. Acting became more natural. The conventions of the silent film disappeared. A director who came to the fore with the use of sound was King Vidor whose film *Hallelujah* (1928) was distinguished by an all-negro cast. New names appeared among movie stars, among them Marlene Dietrich who appeared with Emil Jannings in *The Blue Angel* (1930), a film made in Germany by Von Sternberg. Others made their name in the gangster films which were popular in the early thirties—Edward G. Robinson in *Little Caesar* (1930), James Cagney in *The Public Enemy* (1931), and George Raft and Paul Muni in *Scarface* (1932)—in comedy the Marx Brothers (Groucho, Harpo, and Chico), Laurel and Hardy, and W. C. Fields. The period pieces such as *The Belle of the Nineties* (1934) provided an attractive setting for Mae West. Among other films of the thirties *Little Women* is remembered for the acting of Katherine Hepburn. *Hell's Angels* for that of Jean Harlow, *The Thin Man* with Wm. Powell and Myrna Loy, *Gone with the Wind* with Clark Gable, Leslie Howard, and Vivien Leigh. The early gangster films had idealised the gangster. Their anti-social attitude was killed in such later films as *Crime Does Not Pay* and *The Petrified Forest* with Leslie Howard and Bette Davis. The feature film tended to become more serious and to present social problems in a fearless and provocative manner.

The advances which the Amor. producers had made during the First World War both in production and in securing world markets, enabled them to keep the lead in volume and technical quality in the years that followed. The Brit. film industry had great difficulties in re-establishing itself. In the early twenties under thirty Brit. feature films were made annually, but by 1934 the number had risen to nearly 200. This was largely due to the Cinematograph Films Act, 1927, known as the First Quota Act, which obliged exhibitors to show a minimum proportion of Brit. films as against foreign. In 1929 came the first Brit. sound film. This was *Blackmail* made by Alfred Hitchcock, who in this and his later thrillers—notably *The Lady Vanishes* with Margaret Lockwood, *Michael Redgrave*, and *Paul Lukas*—estab. a reputation for his imaginative use of the medium. Anthony Asquith who made *Tell England* (1931) with Carl Harbord and Fay Compton, and *Walter Forde* who made *Rome Express* (1932) with *Ether Ralston*, *Conrad Veidt*, and *Gordon Harker*, were among other directors who

estab. the Brit. film during the successful decade before the Second World War. Alexander Korda's *The Private Life of Henry VIII* (1933), with Charles Laughton and Robert Donat, was the first of many successful period films, including Paul Czinner's *Catherine the Great* (1934), with Elizabeth Bergner, Victor Saville's *The Iron Duke* (1935), with George Arliss and Gladys Cooper, and *Victoria the Great* (1937), made by Herbert Wilcox with Anna Neagle and Anton Walbrook.

Nearly every country has embarked on film production with great success, but linguistic barriers prevent many worthwhile films from circulating in countries other than that of their origin. Russian production, controlled by the State, has continued to make excellent progress, whilst Fr. films have won a special place by reason of their naturalness, charm, and originality. Mention should be made of René Clair whose genius as a director puts him alongside Chaplin, Eisenstein, and Pabst. His *Sous les Toits de Paris* appeared in 1930, and was followed by *A Nous la Liberté*, *Le Million*, and others. It. films have since the Second World War shown a marked resurgence, and the work of the director, Roberto Rossellini, who made *Open City* (1946) and other films became known internationally. Ger. production suffered a setback during the Nazi regime, but there are signs that it will re-discover its original artistic approach to film-making. In both quantity and technical excellence, however, the U.S.A. continues to hold the field, despite the increasing quality of the output of other nations, in particular Britain. Brit. producers and directors who contributed to the improvement in production during and since the Second World War are, to mention only a few, Anthony Asquith (*The Way to the Stars*), Michael Powell (*The Life and Death of Colonel Blimp*, *A Matter of Life and Death*, and in particular *The Edge of the World*), Carol Reed (*The Stars Look Down*), Sir Laurence Olivier (*Henry V.*), one of the few Brit. technicolor films), Harry Watt (*The Overlanders*, made in Australia), Michael Balcon (*San Demetrio, London*), Sydney Box (*The Seventh Veil*), Gabriel Pascal (*Major Barbara*, *Cesar and Cleopatra*), Noel Coward and David Lean (*This Happy Breed*, *In Which We Serve*, and particularly *Brief Encounter*).

Many actors and actresses of the Brit. theatre have become stars of the screen, notably, besides those already mentioned, Vivien Leigh, Sir Ralph Richardson, Ann Todd, Flora Robson, David Niven, Celia Johnson, Bernard Miles, Rex Harrison, and Eric Portman. James Mason and Stewart Granger are Brit. stars who have headed the list for popularity. Perhaps the greatest individual success in film-making after Charles Chaplin (q.v.), is Walt Disney, whose feature-length cartoon films, beginning with *Snow White and the Seven Dwarfs* in 1938, and followed by *Pinochio*, *Bambi*, and others, pointed the way to a form of film-making which, with skilful use of colour, with perfect synchronised sounds and music, exert

a universal appeal. A survey of films, however brief, would not be complete without mention of the opportunity for music given by the introduction of sound. Scores for films were contributed by such celebrated composers as Vaughan Williams, Arnold Bax, Benjamin Britten, Wm. Walton, Arthur Bliss, while others such as Richard Addinsell, Wm. Alwyn, and Clifton Parker became known chiefly for their work for films. Among film music directors mention must be made of Bretton Byrd, who was associated with the outstanding Brit. comedy films of the thirties with Will Hay, Jack

the cine-film astronomers have known for many years that large masses of incandescent matter are shot out of the sun and can be seen as solar prominences at the time of a total eclipse. Again, the technique of photographing a phenomenon at spaced-out intervals and projecting the film at the usual speed has been applied by the chemist and the metallurgist to the study of the growth of crystals. Hundreds of motions in industry and in the laboratory have been studied with the same technique as that used in the slow-motion films of athletes and race-horses. The value of such



A SCENE FROM 'HENRY V.'

Henry V. (Sir Laurence Olivier) with the French royal family.

Hulbert, and Cicely Courtneidge, also John Hollingsworth, Charles Williams, and in particular Muir Mathieson, who has appeared in films with the London Symphony Orchestra.

Films as an Aid to Scientific Research. The cine-camera is of great use in research work. It can act as a time-expander recording with an 'unblinking eye' intimate details of a process which lasts for a thousandth of a second or even less, and it can spread out its record to show for minutes or hours events that lasted only a few seconds. Conversely, it can be used equally well as a time compressor when pictures taken once every hour can be projected as a continuous film compressing the events of days into a few minutes. The cine-camera can—as in X-ray cinematography—do the same kind of things for the otherwise invisible, giving us, for example, a motion record of events within the animal body which cannot be seen in any other way. Through

films lies in the exactness with which it is possible to take measurements of events too fast to see with the human eye.

In 1946, the estimated amount of money invested in the Amer. motion picture industry was \$2,600,000,000, of which \$127,750,000 were invested in studios. In the same year there were 21,519 cinemas in the U.S.A., 15,425 in U.S.S.R., 5000 in Great Britain, 4579 in S. America, 4422 in France, 3500 in Spain, 2351 in Sweden, 1100 in Belgium. In Czechoslovakia there are 1600, though not all are in operation since the Second World War. Similarly of Germany's 5500 cinemas, many are not in operation since the war, nor, whilst the country is divided into zones, is it possible to assess the number open to the public, although it is known that about 800 were operating in the Brit. zone in 1946. Denmark has 430 cinemas, Holland 379, Switzerland 371, Poland 335, and Hungary 300. See also CHRONO-CHROME;

TECHNICOLOR. See J. R. Cameron, *Motion Pictures with Sound*, 1929; R. Arnheim, *Film*, 1933; R. Spottiswoode, *A Grammar of Film*, 1935; P. Rotha, *Documentary Film*, 1936; A. Buchanan, *Film Making from Script to Screen*, 1937; M. Hardeche and R. Brasillach, *Histoire du Cinéma*, 1935 (Eng. trans. 1938); L. Jacobs, *The Rise of the American Film*, New York, 1939; F. Hardy (ed.), *Grierson on Documentary*, 1946; J. P. Mayer, *Sociology of Film*, 1946; J. Huntley, *British Film Music*, 1947; M. Balcon and others, *Twenty Years of British Film*, 1947; E. Lindgren, *The Art of the Film*, 1948; R. Low and R. Manvell, *The History of the British Film, 1896-1906, 1948*.

Cinerary Urns, hand-made vessels of clay, glass, or sculptured marble, in which the ashes of those who had been cremated were preserved. They are relics of the Stone and Bronze ages of N. Europe, while others of a widely different type are found in Rom. tombs. The urn proper used for containing the ashes is a large flower-pot-shaped vessel, and decorated only on the top; but other urns used were the food-vessel variety, rather broad in shape, and standing low, the drinking-cup variety, tall and slim, with beautiful decorative designs covering the whole surface, and a vessel shaped like a cone, decorated, and having two or three perforations through the periphery, and known as incense cups. These latter were probably used to contain the fire with which the funeral pyre was lighted.

Cingoli, tn. in the prov. of Macerata, Italy, occupying the site of the auct. Cingulum. Pop. 3000.

Cinisi, tn. in Sicily, 15 m. N.W. of Palermo. Pop. 8800.

Cinna, Gaius Helyius, Lat. poet, who was tribune in 44 B.C. His chief work is a poem called *Smyrna*, of which only fragments have survived; it was, according to Plutarch, of an obscure nature, and had taken the poet eight years to write. He was attending the funeral of Caesar, with whom he had been friendly, when the populace mistook him for Lucius Cornelius C., the praetor, and lynched him. Shakespeare has included the incident in his *Julius Caesar*.

Cinna, Lucius Cornelius (d. 84 B.C.), Rom. statesman, was leader of the popular party at Rome. He was elected consul in 87 B.C.; Sulla only permitted this on condition that C. pledged himself not to tamper with the constitution of the state. C., when elected, promptly broke his pledge and impeached Sulla. The other consul, Octavius, drove him out of the city; C., however, enlisted the aid of Marius and his army, and returned to capture Rome. Every one who was unfortunate enough to have incurred their enmity was put to death, and the loss of life through these massacres was very great. In 86 C. was consul with Marius, and held office in the two following years, after Marius's death. When, however, he ordered his soldiers to march into Greece to oppose the returning Sulla, they revolted and murdered him.

Cinnabar, prin. ore of mercury, is the

sulphide HgS. It crystallises in small rhombohedral crystals with an adamantine lustre. The usual method of obtaining mercury from the ore is by roasting the ore when the sulphur is oxidised off into sulphur dioxide, and the mercury distils off and is condensed in a series of flues or chambers. It is found in Almaden in Spain, California, the Bavarian Palatinate, and Idria in Calabria.

Cinnamic Acid ($C_6H_5 \cdot CH \cdot CH \cdot COOH$), or **Phenylacrylic Acid**, a constituent of storax (*Styrax officinalis*), from which it may be extracted by warming the resin with caustic soda. C. A. is a crystalline solid melting at 133° C.

Cinnamomum, important genus of Lauraceae, confined to the E. Indies. There are over one hundred species, many of which yield either cinnamon or cassia, two aromatic barks. *C. zeylanicum* produces the finest cinnamon, and is cultivated in Ceylon; *C. Cassia* produces cassia, and is often used to adulterate cinnamon; *C. Camphora* is the plant from which camphor is distilled. See separate articles for various products.



CINNAMON

Cinnamon, bark of certain small trees belonging to the genus *Cinnamomum* (q.v.). The bark is taken off, and when dry curls up. It is the oil of C. which produces its flavour, and this is prepared from pieces of bark which are first soaked in sea water and then distilled. The oil itself is of a yellowish-brown colour. C. is useful both as a medicine and as a flavouring in cooking. Cassia, which is produced from another variety of the genus, is sometimes used instead of C., but is much coarser.

Cinnamon Stone, variety of garnet so called on account of its resembling cinnamon in its yellowish-brown colour. It is found in Scotland, Ireland, Ceylon, and the U.S.A., sometimes occurring in shapeless masses and sometimes in the form of crystals. The variety found in Ceylon is used in jewellery work.

Cinneroth, Sea of, see under GALLIEE.
Cino da Pistoia (c. 1268-1337), It. poet and lawyer. He wrote a commentary on the first nine books of Justinian's *Code*.

and this was much read, and after 1483 was many times reprinted. He was a friend of Dante, who addressed two sonnets and a letter to him. He was possessed of much genuine merit and passion, which stand forth in many of his poems, though at times he is obscure in expression.

Cinquecento, It. word, meaning literally 500, but used as a contraction for 1500. It is used to describe the new style in all depts. of culture which began to flourish in Italy about the year 1500. The whole civilised world was in reality about to revert to the anct. style of art; everywhere about this period men were seeing the decadence of the Gothic. In France, in Germany, and in England the change was not definitely to come about till later, and when it did come was to be preceded by a period of transition. Thus the new movement was characterised by a revival of classical taste and design in all the arts; C. may thus, when used as an adjective, be said to correspond to the Fr. style *Renaissance* or style *François premier*, and to the Eng. Elizabethan. The change in It. methods commenced in the fifteenth century; Ghiberti and Donatello were the pioneers in sculpture, Alberti and Brunelleschi in architecture. By the end of the century the standard of Brunelleschi, in particular, had been recognised throughout the country. The best examples of C. work in architecture are St. Peter's and the Vatican, in Italy; the Louvre, etc., in Paris; and St. Paul's Cathedral, in London. Among the famous cinquecentists may be mentioned Michelangelo and Benvenuto Cellini, in sculpture; Titian, Leonardo da Vinci, Bramante, and Correggio, in painting; and Berni, Ariosto, and Tasso, in literature.

Cinquesoll, in architecture an ornament consisting of five lobes meeting in points, called cusps, and tangent to the inner side of a larger arc. Arches may be formed with a C.

Cinque Ports, five (*cinque*) large ports on the S.E. coast of England, which once had special privileges and duties. The original five ports were Dover, Sandwich, Hastings, Romney, and Hythe; later the anct. tns. of Winchelsea and Rye and other places were added. Their origin dates back for a long time, possibly to the Rom. times; they were of considerable importance in the A.-S. period, and in a charter of the reign of Edward I. a reference occurs to a previous charter given by Edward the Confessor. After the Norman Conquest William I. made this line of coast into an entirely separate ter. under the jurisdiction of a warden, corresponding to the count of the Saxon Shore (*comes littoris Saxonici*). This official had his residence in Dover Castle, and exercised civil, military, and naval authority, combining the functions of sheriff, *custos rotulorum*, lord-lieutenant, and admiral. The chief duty of the C. P. in early times was to furnish shipping for the state. In the reign of Edward I. they were bound to provide not fewer than fifty-seven ships for a period of fifteen days without recompense, but in return

for this they had many privileges, such as exemption from taxes, the power to make their own by-laws, etc. The C. P. played an important part in the hist. of the thirteenth and fourteenth centuries. Until 1688 one or two of the members for each of the ports were nominated by the lord warden, but after that year they were elected. The Bills of 1832 and 1835 reduced the members for the C. P. from sixteen to three, and since then they have been merged with the co. The Municipal Reform Act has broken up the anct. organisation, and though the anct. courts of Shepway, Brotherhood, and Guestling still meet sometimes, it is as a matter of form. The civil jurisdiction of the lord warden has been abolished, but he still exercises maritime jurisdiction, presides at the court of Shepway (held in the aisle of St. James's Church, Dover), and appoints justices of the peace within the jurisdiction of the ports; he has an official residence at Walmer, and is entitled to £3000 a year for his office. See A. E. Bradley, *England's Outpost: the Country of the Kentish Cinque Ports*, 1921.

Cinthio, name assumed by Giovanni Battista Giraldi (*q.v.*).

Cintra, tn., Portugal, in the prov. of Estremadura, 16 m. N.W. of Lisbon. Owing to its picturesque situation, sheltered by hills, and its agreeably mild climate, it is a favourite resort for the wealthy Lisbon residents. There is an anct. royal palace, partly of Christian and partly of Moorish architecture. C. is noted for the convention which took place in 1808. Pop. 8000.

Cione, Andrea di, see ORCAGNA.

Cionus, genus of Curculionidæ, or weevils, contains sev. Brit. species. These are small beetles, living both in their larval and imaginal states upon plants.

Ciotat, La, seaport of France, in the dept. of Bouches-du-Rhône. It is situated on the Mediterranean coast, 20 m. S.E. of Marseilles, and has a fine harbour. There is a good coasting trade and a noted coral fishery; ship-building is carried on. Pop. 13,400.

Cipher, see under CRYPTOGRAPHY.

Cipolin, crystalline rock, usually containing mica. It is a granular limestone which, through metamorphism, has become a white marble with green veins, the latter being caused by the presence of bands of finely divided mica.

Cipriani, Giovanni Battista, or Giambattista (1727-85), Florentine artist who studied at Rome and, later, settled in London. His graceful drawings soon won popularity. His pictures are not of so high a quality as his designs, which were engraved by Bartolozzi. Designed the diploma of the Royal Academy and many of the exterior and interior decorations of Somerset House.

Circæa, genus of Onagraceæ occurring in cold climates. There are two species in Britain, one of which, *C. luteiana*, the enchanter's nightshade, grows in damp and shady places.

Circars, The Northern, anct. Indian ter. on the E. coast of India, stretching along

the shores of the bay of Bengal. The dists. now corresponding to them are Ganjam, Vizagapatam, Godavari, and Kristna. They became the possessions of the E. India Company.

Circassia, name of a region in the Caucasus, lying in the basin of the Kuban, a portion of the Upper Terok, and S. of the Caucasus on the Black Sea from Anapa to Gagry. Formerly it was a part of the Russian prov. of Kuban, but is now shared between the Krasnodar Ter. of the R.S.F.S.R. and sev. small Caucasian republics. The Russian name for the Circassians is Cherkesses, the Ossetian name Kazaks; the Circassians call themselves Adygheb. When C. was surrendered to Russia by Turkey in 1829, the people refused to submit, and it was not till 1859 that they were finally conquered. After the conquest large numbers emigrated to Turkey, principally in Bulgaria and Thessaly. Most of the common people belong to the Christian religion, though the higher classes on the whole are Muslims. The number of the Circassians dwindled during the nineteenth century, as although they numbered 500,000 in 1850, they were not more than 100,000 at the end of the century. Circassian women are noted for their beauty, and in past times, were often captured by slave-traders. See E. Chantre, *Anthropological Researches in the Caucasus*, 1855-57; and D. Totaciff, *The Soviet Caucasus*, 1912.

Circe, daughter of Perse and Helios and sister of Aetes. She lived on the is. of Aëa, and when Odysseus's followers were cast on this is. she gave them her magic cup to drink from and they were turned to swine. She was unable, however, to bewitch Odysseus, as Hermes had provided him with a herb which enabled him to drink without being transformed. He also compelled C. to re-transform his followers, and spent a year on the is. of Aëa with her.

Circinus, the Compasses, a S. constellation noticed by Lacaille, who placed it below the Centaurus and not far from the S. pole. It contains a white star of 3.4 magnitude, with a brick-red attendant.

Circle, figure enclosed by a curved line called the circumference which is at all points the same distance from a fixed point called the centre. A C. is, therefore, strictly speaking, the space included by the circumference. The distance from centre to circumference is called the radius, and a straight line drawn through the centre and terminated in both directions by the circumference is called a diameter, which is therefore twice the radius in length. A part of the circumference is called an arc, and the straight line joining the ends of an arc is called a chord. The figure enclosed by an arc and its chord is a segment, and that enclosed by two radii and the arc intercepted by them is a sector. An ant. problem is the determination of the ratio of the length of the circumference of a C. to its diameter. This ratio is the same for all Cs., and is an incommensurable quantity, i.e. it cannot be stated exactly in figures. It is repre-

sented by the Gk. letter π , and its value may be approximately rendered by the following quantities: $\sqrt{10}$, $\frac{22}{7}$, $\frac{355}{113}$, 3.1416, 3.1415926535. In the same C., or in equal Cs., equal angles are subtended by equal arcs and by equal chords, therefore divs. of the circumference is a convenient method of measuring angles. The angle at the centre subtended by one quarter of the circumference is a right angle; this is divisible into 90 degrees, each degree into 60 minutes, and each minute into 60 seconds. In the circular measure of angles as employed in trigonometry, the unit is that angle subtended by a part of the circumference equal in length to a radius. The unit is called a radian, and it follows that there are two π radians in four right angles. The properties of the C. are discussed in Euclid's *Geometry*, book III.

Circle, Magic, piece of ground chosen in some dark and lonely place, used by sorcerers and magicians as a place of refuge against evil spirits. The whole area of ground varied, sometimes being 9 ft. square, and on this area were marked out two concentric circles. Within the smaller sat the wizard, for it was a common belief that it was only by remaining on this particular piece of ground that he could prevent the evil spirits, with whom he was dealing, from carrying him away with them.

Circle of Curvature, circle having the same curvature as that at a given point on a given curve. The C. of C. varies for different points on the curve.

Circle of Diffusion, in photography, the degree to which a geometrical point of light is diffused in the image projected by a lens. The maximum permissible diameter of the disk is $\frac{1}{10}$ in., but this is much too large for critical definition, and especially when the image is to be subsequently enlarged.

Circle, Quadrature of the, see QUADRATURE.

Circles of Stones, standing stones formed in circles. They are unhewn and set up at intervals round a circular space, generally on level ground, though they are occasionally found on the slightly sloping side of a hill. They cover a space of ground varying from 20 to more than 100 ft. in diameter, and the number of stones forming the circle also varies. It is impossible to ascertain exactly what the original number may have been, as most stone circles now existing are in a state of dilapidation, sometimes being mere boulders rolled together, or else long stones, wedged upright by smaller ones inserted round their bases, in a hole in the subsoil specially prepared to receive them. These stone circles are often, but wrongly, called Druidical circles in Great Britain, and are known as cromlechs in France. One of the greatest and most interesting stone circles is Stonehenge, a circular group of gigantic stones standing on Salisbury Plain, situated amidst an extensive group of prehistoric barrows of the Bronze Age. Another large circle of unpolished stones is at Avebury (q.v.), Wiltshire. The largest of the Scottish stone

circles is that of Stennis in Orkney, 4 m. from Stromness. Near this particular circle stood the perforated stone through the opening of which it was customary in the eighteenth century for young men and women of the dist. to plight their troth by joining hands, the promise thus made being regarded with superstitious reverence. There is a fine group of standing stones at Callernish (q.r.), Lewis. Scotland contains many other varieties of stone circles, and excavations have disclosed burials of the Bronze Age, chiefly after cremation. In many parts of Europe are found circles of small boulder stones, indicating that the space thus enclosed has been reserved for burial

barons of the exchequer partly for judicial, but principally for financial purposes. The great function of these old itinerant justices was that they linked up the local with the central administration. In 1173 the country was divided into six C. for exchequer purposes. The judicial functions were further developed by commissions of justices to try criminals presented by the hundred and the shire. Edward I. replaced the irregular C. of the itinerants by regular C. of the judges of assize; the country being divided into four C. in 1293, with two judges to each div. The present assizes may be said to date from the close of the thirteenth century, when the judges



RESTORATION OF STONE CIRCLES, AVEBURY

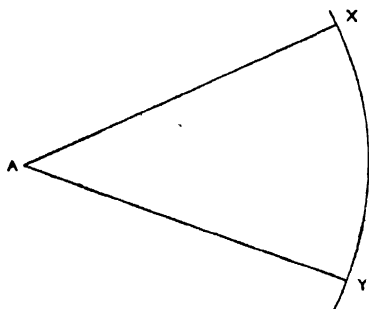
deposits in prehistoric times. Few stone circles are met with in France, and very little is as yet known of the contents of those found. The most important is at Carnac, Brittany. S. of the Baltic, circles of standing stones are rarely met with. See also AVEBURY; CROMLECH; DOLMEN; MENHIR; STONEHENGE. See Sir H. James, *Plans and Photographs of Stonehenge*, 1867; Ferguson, *Rude Stone Monuments*, 1872; Anderson, *Scotland in Pagan Times*, 1886; and Sir N. Lockyer, *Stonehenge and other British Stone Monuments Astronomically Considered*, 1906.

Circleville, tn. in Ohio, U.S.A., in co. Pickaway, was laid out within a prehistoric circular embankment of which no trace now remains, there is an ann. pumpkin show and vegetables are canned. Pop. 7500.

Circuit, Electric, see ELECTRIC CIRCUIT. Circuits, periodical progresses of the judges of the king's bench div. of the high court of justice through the sev. cos. of England and Wales, for the purpose of administering justice in civil and criminal matters. The circuit system dates almost from the reign of Henry I., who organised C. of the judges of the *curia regis* and

of assize were empowered to act under commissions of *nisi prius* (q.r.), *oyer and terminer* (q.r.), and jail delivery. The regulation of the present C. was originally provided for by the Judicature Act, 1875, but this is now replaced by the Supreme Court of Judicature (Consolidation) Act, 1925. At the present day the C. comprise eight divs.: the S.E., Midland, N., N.E., Oxford, W., N. Wales and Chester, and S. Wales. The winter assizes commence about the middle of Jan.; the summer, the middle of May; and the autumn, the middle of Oct. No civil (*nisi prius*) business is taken at the autumn assizes except in Bristol, Devon, Glamorgan, Lanarkshire, and Suffolk. There are additional assizes in May for Lancashire and Yorkshire. In the U.S.A., there are nine federal circuit courts of appeal, each circuit having appellate jurisdiction over sev. federal dist. courts. The President appoints the judges to these circuit courts, but judges of the dist. courts are eligible to sit. These courts have appellate jurisdiction over most of the issues cognisable by the dist. courts, though some issues go direct to the supreme court. See also ASSIZE.

Circular Measure, in geometry, a method of measuring angles. The angle between two straight intersecting lines, AX and AY, is expressed as the ratio of the length of the circular arc XY to the length of the radius AY of the circle; in general, $\text{angle} = \frac{\text{length of arc}}{\text{radius}}$. This expression is independent of the length of the given radius, since, for a given angle, the length of the arc is proportional to the radius.



The unit of C. M. is the *radian*, the angle subtended at the centre of the circle by an arc of length equal to the radius. Since the length of the circumference of a circle = 2π radius, the number of radians in a full circle is 2π , i.e., approximately 6.284. In order to convert the measure of an angle from degrees to radians, multiply by $\frac{2\pi}{360}$ or divide by 57.296.

Circular Note, see CREDIT, LETTER OF. **Circular Numbers**, those which form the last digit of any power to which they are raised. Thus every power of five ends in five.

Circulating Decimals, see DECIMAL FRACTIONS.

Circulating Library, see LIBRARIES.

Circulation, see MONEY.

Circulation of the Blood. Harvey in 1628 was the first to demonstrate that the blood circulates. The ancients had conceived that the arteries held air, and it was generally held prior to Harvey that the blood was pumped from the heart to the veins, and that the blood moved in a to-and-fro movement. He, however, showed that the veins have valves which prevent the blood flowing back, and at the same time he proved that the arteries contained blood, not air. The circulating system consists of arteries, veins, capillaries, and the heart. The arteries are tubes, with stout elastic walls well provided with muscular tissue. They branch in their course, becoming thinner-walled and smaller as they subdivide, and finally they pass into the capillaries, which are very minute and walled only with a single layer of cells. These capillaries run through the tissues and unite to form small veins, and these in their turn are

gathered together to form the large veins. As has been pointed out, these veins often possess valves which prevent a reflux of blood into the arteries. The heart (*q.v.*) is a four-chambered muscular bag, which by its alternate contraction and dilation acts as the pump which maintains the circulation through the body. These four chambers are divided into pairs, the right and left ventricles, and the right and left auricles. The auricles are in communication with the ventricles, but the right chambers of the heart are only connected to the left in the indirect manner shown in the description of the circulation. The vessels which lead from the ventricles are respectively termed the pulmonary artery on the right and the aorta on the left. There are valves between the auricles and the ventricles, that on the right side consisting of three flaps and being termed bicuspid or tricuspid, that on the left being termed mitral and consisting only of two flaps. In order that the blood may circulate through the body it has to describe two circles. It has to pass through the body generally in a large circle, and this is called the systemic circulation, while it further has to pass through the lungs, forming the pulmonary

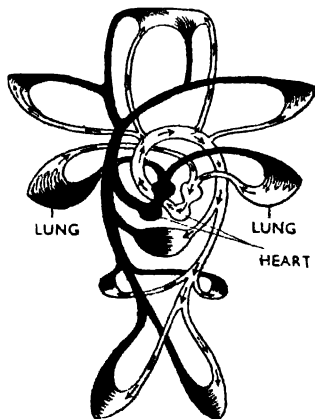


DIAGRAM OF THE CIRCULATION OF THE BLOOD

circulation. In the diagram the black portions will represent the flow of de-oxygenated blood, and the white portions show the flow of oxygenated blood. The two auricles of the heart contract and drive the blood into the still expanded ventricles. Thereupon the auricles relax and the ventricles contract, driving the blood through the aorta and the pulmonary arteries. This alternate contracting and expanding will evidently cause a continual flow of blood in a series of spurts (the pulse beats). The blood driven into the pulmonary artery passes

through it into its two branches, one branch passing through each lung. Here the blood is oxygenated and purified, since it is passed through smaller and smaller branches, ultimately directed into the pulmonary capillaries covering the air cells of the lungs. Here the carbon dioxide is given up and oxygen taken. These capillaries then reunite into four pulmonary veins which carry the blood to the left auricle. Oxygenated as it now is, it is in a similar manner passed again into the left ventricle, and from thence into the aorta, which carries it in a great curve down alongside the vertebral column. Branches are given off from this for the head, the neck, and the arms at the curve, while on its downward course it throws branches to the thorax, abdomen, and legs. From the various branches of the aorta the blood passes into the capillaries, and is again gathered up into the veins after it has parted with its oxygen to the tissues and gathered up the carbon dioxide gas which represents the waste. These veins unite into two large trunks, the superior and inferior vena cavae. The superior vena cava receives the blood from the head, neck, and arms, while the inferior vena cava receives the blood from the rest of the body. Through these the blood is poured back again into the right auricle, whence it repeats the above process, being reoxygenated each time on circulating through the pulmonary system before it begins its course through the general system. The blood of the abdominal viscera, however, takes a different course. It comes from the aorta, but from the capillaries of the stomach, intestines, and spleen, it is gathered into the portal vein. From here it passes into the liver, where again it is distributed into capillaries. At the same time blood travels direct from the aorta to the liver by means of the hepatic artery. It is through the portal vein that many of the products of digestion are carried to the liver, mingling with the blood from the hepatic artery, and the capillaries reuniting to form small veins; these again join together to form the hepatic vein, which carries the blood back into the inferior vena cava. This course taken by the blood from the abdominal viscera, through the liver to the hepatic vein, involving a passage through the two sets of capillaries, is often referred to as the portal circulation (see LYMPH). The heart itself receives its supply of blood from what are termed coronary arteries which spring from the root of the aorta. This blood, after passing through the heart capillaries, is passed directly into the right auricle. The disease angina pectoris is caused by a partial blocking of these coronary arteries.

Comparative.—It is not until we come to the higher worms that we arrive at anything approaching a vascular system, the various types giving rise to manifold stages until the highest stage for them is reached in the possession of a dorsal heart. In crustaceans, arteries are fairly well developed through which the blood is driven from this dorsal heart. The

venous system is lacunar, the venous blood passing along body cavity spaces to the gills and thence back to the heart. In insects the vascular system is not very distinctly developed. In molluscs the arterial system is fairly well developed. Passing to the vertebrates, the heart is a ventral and not a dorsal vessel. The typical fish circulation involves the fact that the heart always contains deoxygenated blood, which is taken by the afferent branchials to the gills, where it absorbs oxygen. The dorsal aorta, formed from efferent branchials which drain the gills, carries the blood to the body; thus showing the great difference between them and the higher vertebrates, in whom the dorsal aorta arises from the heart. Moreover in fish the blood travels along a single circuit, in contrast to the double circulation of higher vertebrates. In amphibians the heart has developed into a three-chambered organ. They have a right and left auricle and one ventricle; the ventricle drives the blood to the head, body, and lungs, while the right auricle takes deoxygenated blood from the body, and the left oxygenated blood from the lungs or gills. In all these stages oxygenated and deoxygenated blood is more or less mixed, and it is only in birds and mammals that there is a complete separation of the two sides of the heart, resulting in the separation of the arterial and venous systems, so that they can only communicate through capillaries. In birds the aorta goes to the right, while in mammals it goes to the left, but except for the fact that their hearts are different in structure, and for the above fact, the circulatory systems are similar in birds and mammals. In this matter the metamorphosis of the frog affords a striking example of the evolution of the circulatory system from the fish-like arrangement of the tadpole to the circulation of the adult frog as described above. See W. Harvey, *De Motu Cordis et Sanguinis*, 1628 (Eng. trans., *The Motion of the Heart and Blood*, in Everyman's Library); C. Singer, *The Discovery of the Circulation of the Blood*, 1922, and *Short History of Biology*, 1931.

Circumcision (Lat. cutting round), cutting off of the foreskin (prepuce), is a rite of ant. origin and widespread use. It was practised among the early Egyptians, as is proved by extant monuments; and it is a primitive Arab custom. It was practised by the Aztecs, and at the present time by all Muslims, the Kaffirs, the Australian aborigines, the Papuans, and the Jews. The last-named people regard it, as they have always done, as a custom of great religious importance; and one of the earliest controversies of the Christian Church was on the subject of its retention. The reason for the rite is not known, but it originated probably either as a sacrifice or as a distinctive tribal mark, like tattooing. C. is also practised on purely medical grounds in cases where the foreskin cannot be drawn back to allow cleansing of the underlying parts, or when the opening of the prepuce is so small as

to obstruct the flow of urine. It is a trivial operation in infancy.

Circumcision, Feast of, religious festival observed both by the Rom. Catholic and Anglican Churches, celebrating the C. of Christ. It is commemorated on New Year's Day, Jan. 1.

Circumference (Lat. *circum*, round, and *ferre*, to carry), or periphery, is the name given to the curved line which encloses a plane geometrical figure, such as a circle, an ellipse, etc. The length of the C. varies according to the nature of the curve, and there are different formulæ to ascertain it. The C. of a circle, for example, is $2\pi r$ (r , radius; π , 3.1416).

Circumferentor, name of a mathematical instrument used chiefly in connection with the surveying of mines, etc. It consists of a compass, with diametrical sights, the dial of which is divided into degrees. This is attached to a stand, and can be adjusted so that the angle which the line of sight makes with the magnetic N. can be observed on the dial.

Circumlocution Office, name applied, in satire, by Charles Dickens in *Little Dorrit* (1885), to gov. offices on account of their interminable delays—duties being so divided that the simplest process had to pass through a whole body of officials. Some of the more ludicrous of these circumlocutions are recorded in Baron Stockmar's *Memoirs*, 1888.

Circumnavigation means literally sailing around, but is usually applied to voyages round the world. Among famous circumnavigators may be mentioned Francis Drake (q.v.), Bougainville, one of the first Frenchmen to sail round the world (1766); and Capt. Cook (1776–1779).

Circumpolar Stars, see under STARS.

Circumstantial Evidence, see under EVIDENCE.

Circumvallation. In fortification, an entrenchment or chain of defensive works, erected by a besieging army, but facing outwards towards the country, so as to guard against attempts at relief by a field army, is called a line of C. The field-works are sometimes connected by a parapet or a rampart.

Circus (Lat. *circus*; Gk. κίρκος or κίρκος, a circle or ring), was anciently a space, circular, oval, or sometimes oblong in shape, which was intended for the performance of races and athletic contests. The Rom. C. was in the form of an ellipse cut in half at its vertical axis, whilst along the transverse axis the fence (*spina*) ran, which separated the starting course from the return course. The seats rose in tiers parallel to the sides of the course, and in a crescent round one end; there were no seats at the other end, which was the front of the building, and the main entrance, but the *carceres*, or stalls, for the horses and chariots were here. The seats were made of stone in the lower tiers, and in the others of wood. The lower seats were reserved for members of the upper classes, whilst there were a few *cubicula*, or state boxes, for the giver of the C. and his friends. The C. was the only public spectacle at Rome in which

the sexes sat together. The *spina* was decorated with carving and statues, besides seven figures of dolphins and seven oblong objects, of which one was removed after every lap, as a race consisted of seven rounds of the course. Colours were used to distinguish the various chariots and their drivers. At first only red (*russula*) and white (*albata*) were used, but later green (*prasina*) and blue (*veneta*) were introduced. Domitian introduced purple and gold (*purpureus et auratus pannus*), but afterwards their use was discontinued. Chariots with two horses (*bigæ*) or four (*quadrigæ*) were generally used, though sometimes there were three (*trigæ*) or even more than four horses. The drivers (*aurigæ*) were members of the slave class; the best horses came from Sicily, Spain, and Cappadocia. The chief C. at Rome was the C. Maximus, built in 329 a.c., though races had previously been run on the site. The C. Flaminius, built in 221 a.c., the C. Caligula, afterwards known as the C. Neronis, and the C. built about A.D. 311 by Maxentius, were the remaining Cs. of Rome. Of these only the last-named has been preserved. The modern C., which dates from the eighteenth century, has not much in common with the anc. It is often nomadic in character, and the performances are given in a tent, with a central arena. The *pièce de résistance* of the modern C. has been a display of equestrian skill. Jumping through hoops, riding two horses at the same time, and such exhibitions, varied by the witticisms of the traditional clown, formed almost the sole attractions for a long time. Philip Astley popularised the C. in London at the end of the eighteenth century, followed by the noted horseman Andrew Ducrow, Batty, Hengler, and Sanger. P. T. Barnum revolutionised the C. with his 'biggest show on earth,' in which he gave displays necessitating the use of intricate machinery and large companies. His chief successor was the late Bertram Mills. At the London Hippodrome, which was built as a C., menagerie, and variety theatre, various animals have appeared on the stage, and many realistic representations of natural scenes have been given. At the Paris Hippodrome, which resembles a Rom. C. in having a central stage, chariot races were run after the Rom. fashion at the end of the nineteenth century for prizes offered by the management. The modern C. is almost entirely a display of trained animals varied by acrobatic feats, but conditions are very different from what they were in the nineteenth century. The greatest advance is in the cessation of cruelty towards animals, especially since cruelty teaches the animal nothing and makes it unreliable. First the animals are taught not to fear man, and then they learn simple tricks by repetition, usually followed by reward. While amusing themselves in the training den the animals are watched, and an animal's natural aptitude for any particular type of trick is soon discovered. In a modern C.

not only horses and dogs but every kind of animal will perform—lions, tigers, seals, elephants, and monkeys. Transporting animals from their native country to captivity is an organised trade, but some animals, especially monkeys, have difficulty in becoming acclimatised. They travel backwards and forwards on tramp steamers until they become used to change. In America, where the distances that the C. has to travel are great, the animals travel by rail in vans, but in England the C. travels along the roads at night, drawn by steam power; on the Continent Cs. are usually stationary.

The greatest modern development of the travelling C. has taken place in the U.S.A., where it has proved vastly profitable on account of the extent of the country and the considerable number of large fairs, which furnish the audiences. The start in this direction was made by the famous showman P. T. Barnum and by 'Buffalo Bill' Cody, who had a Wild W. show rather than a C. strictly speaking. Adam Forepaugh and the Sells brothers were the next to come, followed finally by the Ringling brothers, who eventually absorbed practically all their biggest rivals. Under the Ringling regime the C. is no longer a more or less Bohemian affair, but a vast business organisation with its advance agents to procure sites for the vill. of tents, properly to advertise in all the countryside, and make provision for the large amount of food for the army of employees and fodder for the hundreds of horses and for the immense travelling menagerie. The Ringlings have their own trains and make journeys of from 150 to 400 m. overnight by rail from tn. to tn. See P. T. Barnum, *Autobiography*, 1854 (enlarged in 1888); M. R. Werner, *P. T. Barnum*, 1923; R. Gómez de la Cerna, *El Circo* (Valencia), 1924; J. Lloyd, *My Circus Life*, 1925; M. W. Disher, *Clovens and Pantomimes*, 1925; Lady E. Smith, *British Circus Life*, 1948.

Cirencester, or **Cicaster**, parl. bor. in Gloucestershire, England, situated on the R. Churn, and connected with the Thames and Severn Canal. It is 16 m. S.E. of Gloucester, and 14 S.E. of Cheltenham. Agriculture is the chief industry, and the manufs. are unimportant. The Royal Agric. College is here. Carpets and curriers' knives are made. It has a fine live-stock market. C. was founded by the early Britons, and became a Rom. station under the name of *Corinium*. Various Rom. remains have been discovered. Pop. 10,600.

Cire Perdue, name given to an old method of producing bronze statues. The molten bronze was poured into a model made in wax which had been cased over, and as the bronze melted the wax it assumed the shape of the model.

Cirie, It. tn. in Piedmont, which lies about 12 m. from Turin. Pop. 8000.

Ciro, It. tn. in the prov. of Catanzaro. It lies N.W. of Cotrone and near the Ionian Sea. Pop. about 8500.

Cirpan, or **Tehirpan**, th. of E. Rumelia,

Bulgaria, 30 m. E.N.E. of Plovdiv (Philippopolis). Pop. 11,000.

Cirque, or **Corrie**, crater-like basin, semicircular in shape, occurring at the head of a valley or in the side of a mt. They are caused in hillsides by a permeable soil overlaying a hard rock, and by the water dissolving this permeable soil and causing a collapse of the ground, leaving the formation above referred to. In glacial regions Cs. are said to be due to the wearing away of the land by the action of the ice.

Cirrhosis, disease of some of the internal organs of the body, such as liver, lungs, and kidneys. It is due to continual inflammation, and consists in the hardening and shrinkage of the parts, making them horny. See under **LIVER**.

Cirripedia (Lat. *cirrus*, curl, *pes*, foot), order of Crustaceans which includes the barnacles and acorn-shells (*g.r.*). All the species are marine, and live in either a parasitic or a sessile state. Nearly all the species are hermaphrodite, but in some genera dwarf male forms known as *complemental males* are also to be found.

Cirrus, see **CLOUD**.

Cirrus, botanical term applied to a tendril formed from the apex of a leaf, and the corresponding adjective is *cirrose*.

Cirta, formerly the cap. of Numidia. It is now called Constantine, having been restored by the Emperor Constantine the Great.

Cisalpine Republic (Lat. *cis*, on this side, meaning on this side of the Alps, and originally so used by the Romans), was formed in 1797 by the joining of the Cispadane and Transpadane republics formed the year before by Bonaparte. The whole republic consisted of Mantua, Brescia, Lombardy, Cremona, Verona, Rovigo, Modena, Massa, Carrara, Romano, Ferrara, and Bologna. The headquarters of the gov. was Milan, and its army consisted of Fr. soldiers. It was eventually known as the It. republic, and a little later Napoleon received the title of king of Italy.

Cisneros, **Francois Ximenes de** (1436-1517), see **XIMENES** (OR **JIMENES**) **DE CISNEROS**, **FRANCISCO**.

Cissampelos, genus of Menispermaceae. *C. Pareira*, the pareirabrava, is a native of sev. W. Indian is., and of Brazil. The root is employed in Europe as a tonic diuretic, and the juice of the fresh plant in its native country is said to be an efficacious application to the bites of serpents.

Cissbury, large prehistoric earthwork with a number of deep, circular pits, in Sussex, England, 2 m. N. of Worthing. It contained flint instruments of the Stone Age. Rom. antiquities have also been found. Near by is Chantonbury Ring (*g.r.*).

Cissoid (Gk. *κισσός*, ivy), cuspidal curve invented by Diocles, the mathematician of Alexandria. He came across it in his investigation of the problems of the trisection of a plane angle and the finding of two mean proportionals between two straight lines. One method

of describing the curve is as follows: In a circle draw any diameter. Then erect two perpendiculars on this diameter at equal distances from the centre and on the same side of the diameter. Let one of these cut the circumference in a point C, and let A be the extremity of the diameter on the same side of the centre. Join CA and let it cut the other (produced) perpendicular in P, then the locus of P is the C. curve. The tangent to the circle at the other end of the diameter is the asymptote to the curve which consists of two similar portions on either side of the diameter with a cusp at A.

Cistaceæ, order of dicotyledonous plants, contains trees, shrubs, and herbs bearing beautiful flowers. There is considerable diversity among the various species.

Cistelidæ, family of coleopterous insects nearly related to the Tenebrionidæ, differs from it chiefly in that the species have the claws of the tarsi comb-like. Little is known about these beetles.

Cisterciens, name given to the members of a monastic order, which was founded by Robert of Champagne, a Benedictine abbot. After many attempts he estab. with twenty companions, in the forest of Cîteaux (Cistercium), near Dijon, a monastery for the purpose of carrying out the strictest observances of the rule of St. Benedict. After a time the order was blessed with the pope's favour and confirmation, and the Institutum Monachorum Cisterciensium was drawn up, declaring the new foundation to be the home of the only true Benedictinism. The order was, however, in a very languishing condition when the famous St. Bernard joined it in 1113; two years later he became the first abbot of Clairvaux, which was henceforward the centre of the movement. The C. were known in France about this time as Bernardines. Their influence spread rapidly during the twelfth century; before the end of that period they possessed 800 abbeys, and by the middle of the thirteenth century they had about 2000. Their first Eng. estab. was Waverley Abbey (1128), near Farnham in Surrey. When the monasteries were suppressed by Henry VIII., the order had seventy-five abbeys and twenty-six nunneries in England, and eleven abbeys and seven nunneries in Scotland. Of the Eng. abbeys may be mentioned Woburn, Tintern, and Kirkstall; of the Scottish, Melrose, Dundrennan, New, and Deer. The last remnants of the order were suppressed at the end of the eighteenth century but the order was revived by the Trappists in the nineteenth century. At Mt. St. Bernard, near Coalville, Leicestershire, there is a 'mitred' abbey built by Pugin the elder. The most noteworthy Fr. abbey, besides Clairvaux, was Pontigny, which had 700 benefices in its gift. The O. owed their downfall to their increased worldly prosperity; they could not serve God and Mammon, and consequently as their riches grew, their austerity of life dwindled, and many of the more earnest members left them and founded new orders, such

as the Feuillants and the Trappists. They were principally interested in agriculture and Gothic architecture. Their dress was a white robe with a black scapulary. See also TRAPPISTS.

See MAURIQUEZ, *Annales Cistercienses* (4 vols.), 1642; Cardinal J. H. Newman, *The Cistercian Saints of England*, 1844-1845; H. Collins, *Spirit and Mission of the Cistercian Order*, 1866; F. A. Gasquet, *English Monastic Life*, 1904; D. Knowles, *The Monastic Orders in England*, 1940, and *The Religious Orders in England*, 1948.

Cistern, see under WATER.

Cisternino, lt. tn. in the prov. of Bari. Pop. 3000.

Cists (Gk. *κίστη*, Lat. *cista*, a box or chest) belong to the early ages of man, and were enclosures formed of stones, the latter being placed on end and another slab of stone being used as a cover. These C. were found in barrows or mounds of earth which were placed on the spots where burials had taken place, and one barrow sometimes contained more than one cist. A cist was also a small receptacle carried at the Gk. mysteries.

Cistus, or **Rock-rose**, genus of Cistaceæ, contains sev. very beautiful plants bearing large red or white flowers. The species are indigenous to the Mediterranean, but are cultivated in Britain as ornamental shrubs.

Citadel, strong fortress situated in or near a city, to keep the inhab. of the city in due order and submission, and also to form a rallying-point and last place of defence when the tn. is attacked. Famous Cs. of the past include the Acropolis of Athens and the Rom. Capitol.

Citation, process in the commencement of a suit by which the parties are commanded to appear before the consistorial courts (see under ECCLESIASTICAL COURTS). In the old prerogative courts it was called a decree. In a wider sense C. denotes the act of summoning a person to appear before any judge. C. was formerly the method of commencing all probate proceedings requiring the aid of the court, whether arising out of common form business or otherwise; its object was to compel a representation to be taken by those who were primarily entitled to it, or to provide a substitute for a voluntary remission on their part. The word C. is also used to denote the citing of reports and authorities in a court of law to establish any proposition submitted to the court.

Citeaux, Fr. hamlet in Côte-d'Or. N.E. of Beaune. The remains of its abbey still exist, and the Cistercian order of monks was founded here in 1098.

Cithæron (Gk. *Κιθαίων*), range of mts. in Attica, separating Megaris and Boeotia. Its highest point is Mt. Elatia.

Citharinus, fresh-water fish of tropical Africa. *C. Geoffroyi*, the moon-fish of the Nile, is a well-known species about 3 ft. in length.

Citium, anc. name of Larnaca (q.v.).

Citæen, see CRY.

Citral, aldehydic terpene occurring in lemon and lemon-grass oils, and in other

essential oils. Chemical formula $C_6H_8O_7$, boiling-point $228-29^\circ$. On heating with potassium bisulphate it forms cymene. It can be obtained from geraniol, the corresponding alcohol, by mild oxidation.

Citric Acid ($C_6H_8O_7$), constituent of the juices of many fruits. It occurs in large quantities in lemons, in smaller quantities in unripe gooseberries, raspberries, etc. It is usually prepared from lemon juice, which is boiled and then treated with calcium carbonate. The resulting calcium citrate is decomposed with dilute sulphuric acid, and the C. A. filtered off, after which the filtrate is evaporated to crystallisation. C. A. is a crystalline solid melting at $100^\circ C.$, soluble in water and alcohol. It has the property of preventing the precipitation of certain metallic hydroxides from solutions of their salts, and is used for this purpose in calico-printing.

Citrine, Walter McLennan, first Baron Citrine (b. 1887), Brit. trade union leader, b. in Liverpool. Joined the trade union movement in the Merseyside. In 1914 he was appointed dist. secretary of the Electrical Trades Union; in 1917 he became president of the Federated Engineering and Shipbuilding Trades, Merseyside; and, in 1925, general secretary of the Trades Union Congress. Visited Finland during the Russian invasion of 1940, and also the W. Indies shortly after the Trinidad riots and disturbances in Jamaica. Has written on trade unions, Labour policy, and the Soviet. Chairman of a committee to study the question of regional boards for production, which pub. its report in May 1942. Took a leading part in the struggle to secure the repeal of the Trades Dispute Act of 1927. Chairman of Brit. Electricity Authority, 1947.

Citrine, yellow pellucid variety of quartz resembling topaz in colour. This yellow strain is caused by the presence of iron oxide. Also called Sp. topaz.

Citron, or *Citrus medica*, Asiatic species of Rutaceae cultivated on account of its acid fruit. It is closely allied to the lemon, which it greatly resembles, but it is larger and has a thicker and fragrant rind which is used in the preparation of perfumes and confectionery.

Citronella, name of a fragrant ethereal oil obtained from the grass *Andropogon Nardus*, which is cultivated in Ceylon and grows wild in Africa, Australia, and tropical Asia.

Citronwood, name applied to sev. kinds of wood used in furniture-making, is most properly applied to that of *Thuja orientalis*, a coniferous tree often spoken of as the arbor vitae of China.

Citrulline, recently discovered amino acid, first isolated from the water-melon (*Citrullus vulgaris*). It may also be isolated from the products of the tryptic digestion of caseinogen. C. is closely connected with the bodily mechanism concerned with urea excretion.

Citrus, genus of about thirty aromatic evergreen shrubs and trees. *C. Aurantium* is the sweet orange, *C. decumana* the shaddock, *C. Limonium* the lemon, *C. medica* the citron, while the lime, sweet

lime, bergamot and Seville oranges are well-known varieties of *C. Limonium* and *C. Aurantium*.

Cittadella, tn. situated in the N. of Italy on the Brentella, and in the prov. of Padua. A medieval tn. surrounded by superb walls. Pop. 12,500.

Città della Pieve, tn. of Italy, situated in the prov. of Umbria. Perugino was born here. The tn. sustained some damage from shelling and from Ger. mines in the Second World War. The most important church, Santa Maria della Mercede, was unharmed; the oratory of San Francesco was badly hit in its non-monumental parts, but was otherwise spared. The roof of the cathedral was damaged and the campanile thrown down. Pop. 9100.

Città di Castello, It. tn. in the prov. of Umbria, central Italy. It is situated on the Tiber, N.W. of Perugia, and possesses an old cathedral and sev. palaces, as well as some beautiful old pictures. In the Second World War the Gers. mined the Porta Santa Maria, a fifteenth-century structure, but otherwise damage to the tn. was slight. Pop. 32,000.

Cittanova, tn. in the prov. of Reggio di Calabria, Italy, near the tn. of Palmi and 31 m. N.E. of Reggio. It was built from the ruins of the former Casalnuovo, which was destroyed by an earthquake in 1783, and it took its present name in 1852. Produces olive oil. Pop. 15,000. Also the name of a vil. 4 m. from Modena, N. Italy, which represents the former Città Geminiana, a city founded in the eighth century by the exiles of the anct. Rom. colony of *Mutina* (Modena) which had been devastated by the Lombard invasion but restored in the ninth century.

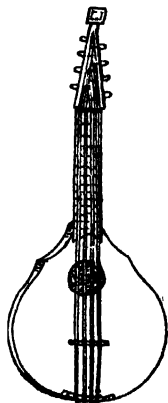
Cittanova, or **Cittanova D'Istria** is the name of a small port at the mouth of the Quieto R., forming the S. tip of the boundary of the Free Ter. of Trieste. Pop. 3000.

Città Sant' Angelo, It. tn. in the prov. of Teramo, situated N.E. of Penne and near the Adriatic Sea. Pop. about 3000.

Città Vecchia, see under MALTA.

Cithara, **Cithara**, or **Cithern** (Lat. *cithara*, Gk. *κύθα*), old instrument which resembles a guitar. It was strung with wire, and each pair of its four pairs of strings were tuned in unison. It was generally played with a plectrum.

City (through Fr. *cité*, from Lat. *civitas*), hor. or tn. incorporate, which is or has been an episcopal see. There are so many exceptions, however, to this definition, that the term is often used indiscriminately of any large industrial centre. The



CITHERN

Roms. used the word *civitas* to denote the whole state or body politic, *urbs* and *municipium* being applied to tns. This meaning of the word has been totally lost in modern times, but the large Cs. of the United Kingdom and the U.S.A. do somewhat resemble the Cs. of ant. Greece in their local self-government. The Gk. *polis* represented a collection of families, gathered together within a certain space, who administered their own foreign and domestic affairs, and had their own religion. These Cs. were only bound by affection to the *μητρόπολις* (mother city), of which they were, in a sense, colonies. The indeterminate use of the word C. probably began at a very early date. Du Cange in his glossary of medieval Lat. words defines the word *civitas* as *urbs oppidalis*, and says that tns. were called *oppidu* or *castra*. The modern definition, given above, is derived from his glossary, yet there were exceptions to this rule at an early period. For example, Dorchester and Sherborne were once episcopal sees, but have never been called Cs., not even now that they have corporations. In the Domesday Book Gloucester and Leicester are called both *civitas* and *burgum*. The word is now used chiefly as an honorary title, as it is thought to confer more dignity than the word *town*. In 1889 Birmingham, though not an episcopal see, was raised to the rank of a C. on account of its industrial importance; since that time the title has been conferred on many other tns. incorporate in the United Kingdom, and it is the common ambition of growing tns. to be so called.

In the U.S.A. a C. may be defined as an incorporated municipality, governed like an Eng. bor. by a mayor, aldermen, and common council. For all practical purposes the term is synonymous with municipal corporation. Cs. existed in Virginia from the commencement of Amer. hist., though it is not clear that these Cs. were chartered, or that the title they assumed was anything more than vainglory. In certain cases, where the pop. has grown very considerably and the tn. has spread into numerous suburbs, the term C. is applied to the space within the original boundaries, as, for example, the Cité of Paris. Thus, curiously enough, London, which is called the largest C. in the world, has within it two Cs., the C. of London and the C. of Westminster. A citizen, as defined by Aristotle (*Politics*, III. 1.), is one who has the right to take part in the legislative proceedings of the state to which he belongs. He is a subject with particular privileges. In ant. Rome there were two kinds of *cives*. The majority had certain private rights of citizenship, such as the right of intermarriage (*jus connubii*) and right of trade intercourse (*jus commercii*) with the allies or friends of Rome. A few, however, had special privileges, of voting in the tribe, and were eligible for the higher offices of state. The rights of citizenship were generally acquired by birth, but both parents had to be Rom. citizens. At a later period, it merely denoted free birth as opposed to those who were born slaves.

The word *citoyen* was particularly popular during the Fr. Revolution, as it was felt to express all that *liberté, égalité, et fraternité* comprised. It was used as the common title of address, irrespective of the person's position. The term, however, fell into disuse when the gov. came into the hands of Napoleon. In Great Britain it has never been used to any great extent, and its meaning is indefinite.

'City of Benares,' Brit. liner which sailed from Liverpool for Canada, Sept. 13, 1940, with a party of ninety children being evacuated from air-raided England, together with ten adult escorts and a crew and other passengers numbering 306. Four days later she was torpedoed by a Ger. U-boat at night in mid Atlantic, 600 m. from land, and sunk. Nearly all the children were below, and many were asleep. Rescue efforts were defeated by tempestuous weather and heavy seas, many boats being swamped. There survived of the children aboard, who had sailed under an official scheme of evacuation, only seven, and of their escorts four. The fourth officer and thirty-two *Lascars* were also saved, but the remainder, including the captain, perished. See Elspeth Huxley, *Atlantic Ordeal*, 1941.

City of London School, founded by John Carpenter, clerk of the city, in 1442. It was estab. and erected under the authority of an Act of Parliament in 1834 on the site formerly occupied by Honey Lane Market, Cheapside. In 1883 it was removed to its present site on the Victoria Embankment. It is endowed with an ann. sum derived from certain estates left by the founder for educational purposes, and is under the government of the corporation of London.

City of Refuge. These cities were six in number (Num. xxxv.), three to the E. and three to the W. of Jordan, and were set apart to protect people who had committed murder unintentionally.

Ciudad Bolívar, tn. of Venezuela and cap. of the state of Bolívar. It stands on the r. b. of the Orinoco and is the principal port of its basin. Steamers run to Trinidad and along the Venezuelan coast, and in the rainy season far up the riv. It was founded in 1764 as Angostura (the Narrows), but renamed C. B. in 1849. It suffered severely in the war of independence when for a time it was Bolívar's headquarters. It is the seat of a bishop. It exports hides, rubber, coffee, cocoa, tobacco, and cattle. The trade is mostly in Ger. hands. The mean temp. is 83°, but the climate is healthy. Pop. 25,000.

Ciudad de las Casas, see SAN CRISTOBAL. Ciudad Juárez, tn. of Chihuahua state, Mexico, on the border between that country and the state of New Mexico, U.S.A. It was formerly known as El Paso del Norte and it is connected by bridge with the Texan tn. of El Paso (q.v.). Pop. 55,000.

Ciudad Porfirio Díaz, tn. in the prov. of Coahuila, Mexico. It is situated on the Rio Grande and on the Mexican International Railway. It was originally known as Piedras Negras. Pop. about 5000.

Ciudad Real (Royal City), cap. of the prov. of the same name, and an episcopal see, is situated 61 m. S. of Toledo and 105 m. S. of Madrid, between the Rr. Guadiana and Jabalón. There are the remains of the tn. walls, with a fine gateway, a beautiful Gothic church, and a hospital. Manufs. of woollen and linen goods are carried on. Pop. 23,600; prov. 557,900.

Ciudad Rodrigo, fort. tn., Spain, in the prov. of Salamanca. In 1706 it was taken by the Eng., and again in 1812 by Wellington, who was created duke of C. R. There are manufs. of leather and soap. Pop. 10,000.

Ciudad Trujillo, until 1936 Santo Domingo, cap. of the Dominican Republic, situated on the S.W. coast of the is. of Haiti. It is the oldest European tn. of the Americas, having been founded by the brother of Christopher Columbus in 1496. It has a harbour and is chiefly engaged in the export of sugar. Pop. 139,000.

Ciullo d'Alcamo, see CIRLO DALCAMO.

Civet, or **Viverra**, old-world genus of cat-like carnivores, typical of the family Viverridae. The genus contains the largest species in its family, and, like most of its allies, has a scent gland near the sexual organs from which the perfume C. is obtained. The animals are long and thin of body, and have long heads and short ears; the legs are short, the feet are small and hairy. In habit the Cs. are terrestrial, and they feed chiefly on birds and reptiles. The penetrating odour of the C. makes it of value as a perfume, and the animals are often kept in captivity in order that it may readily be extracted from them. *V. civetta*, the only African species, yields the best-known C. perfume of commerce; *V. zibetha* is the widely distributed Indian C.

Civetone, ketone present in natural civet (*q.v.*), obtained from the civet cat and used in perfumery. It is an unsaturated ketone, melting at 31°, and having the formula $C_{15}H_{22}O$. Civetol is the corresponding secondary alcohol.

Civiale del Friuli, It. tn. in the prov. of Udine, about 9 m. from the city of Udine. The tn. is noteworthy for its fifteenth-century bridge over the Natisone and for the anct. baptistry of its cathedral. The chief manufs. are linen and cotton goods. Pop. about 4600.

Civil Air Guard, organisation estab. in Great Britain in 1938 to give training in aviation to civilians of both sexes whose services might be required in times of emergency. It operated through light aeroplane clubs, and comprised a gliding section.

Civil Aviation, see AVIATION, CIVIL; AIR MAIL, ETC.

Civil Defence, see AIR-RAID PRECAUTIONS.

Civil Engineering, see CIVIL ENGINEERS, INSTITUTE OF, and under ENGINEERING.

Civil Engineers, American Society of, association of professional engineers of all branches, founded in 1852, for the advancement of engineering and architectural knowledge and practice. It holds an ann. convention in the summer,

at which there are technical discussions on the various papers submitted by its special committees and at which excursions to places of professional interest are arranged. Among the more important questions considered in recent years by the society have been the preservation and utilisation of Niagara Falls, the regulation of the flow of the Great Lakes, the engineering aspects of civil aerial transport, and the engineering features of the national cap. It now comprises about fifty local sections and nearly a hundred affiliated student chapters in colleges throughout the U.S.A.,

Civil Engineers, Institution of, granted a charter in 1828, in which civil engineering is described as the art of directing the great sources of power in nature for the use and convenience of man as the means of production and traffic in states, both for external and internal trade, as applied (1) in the construction of roads, bridges, aqueducts, canals, riv. navigation, and docks for internal intercourse and exchange; (2) in the construction of ports, harbours, moles, breakwaters, and light-houses; (3) in the art of navigation by artificial power for the purpose of commerce; (4) in the construction and adaptation of machinery; and (5) in the drainage of cities and tns.

Civil Estimates, expenditure of the various depts. of state, excluding that of the three fighting services. The C. E. are pub. annually as a White Paper. They are divided into nine classes: central gov. and finance; foreign and imperial; home dept.; law and justice; education and broadcasting; health, labour, and insurance; trade and industry; common services; war pensions; miscellaneous. Between 1933 and 1938 C. E. grew steadily each year from £409,000,000 to £521,000,000. In 1945 it had risen to £1,211,190,938, of which £574,740,058 was attributable to the ordinary services and £636,450,880 to special war services. The total (including revenue depts.) for 1947-48 was £1,970,897,042, a decrease of £423,868,402 on the total for 1946-47 (including the supplementary estimates).

Civilisation, see under ANTHROPOLOGY.

Civil Law. This is generally understood to mean the municipal law of the Rom. Empire, as comprised in Justinian's Institutes, Digest or Pandects, Codes, *Novellæ* (supplementary to the Institutes), containing new constitutions by himself and some of his successors. These form the *corpus juris civilis*. As applied to modern systems, C. L. means the municipal law of those countries that have founded their system upon the Rom. law. Scots law is founded upon the C. L., as is the Code Napoléon. The N. states of the U.S.A. administer a system founded on common law, whereas in Louisiana a C. L. system is in vogue. Many of the principles of the canon law as administered by the eccles. courts (*q.v.*) are borrowed from the Rom. law. The common law (*q.v.*) of England is generally assumed to be indigenous, but the Eng. law merchant which is now incorporated in the common law owes much of its uniformity to ana-

logies drawn by such judges as Lord Mansfield from, among other sources, the Rom. Pandects.

Civil List. In former times the whole expenses of the gov., except that of the army, navy, and military depts. in general, were paid from the possessions of the Crown. In the reign of William III. the Commons separated the regular and domestic expenses of the king from the public expenditure, and took control of the latter. From 1697 until the reign of George II. the C. L. was fixed at £700,000, in the reign of George II. at £830,000, and at £800,000 in the time of George III.; these amounts were often supplemented by additional grants. All salaries were taken out of the C. L. at the time of William IV.'s accession, and the amount was fixed at £510,000. On the accession of Queen Victoria, the amount was £385,000, to be devoted solely to the support of the household of Her Majesty and the maintenance of the dignity of the Crown. The C. L. for the present reign is £410,000 per annum, from which is to be deducted, pending the birth of a duke of Cornwall, the balance of the Duchy of Cornwall revenues after payment of certain annuities to the Princess Elizabeth, etc.

Civil Research Committee, see ECONOMIC ADVISORY COUNCIL.

Civil Service. All officers of the Crown who are engaged in the administration of the civil affairs of the state belong to the C. S.; the military, naval, and air services are included. Employment exchange clerks, school inspectors, postmen and telephone girls, research scientists in gov. laboratories, these and many more are civil servants. The service is divided into various depts., the total number of which is large (350,000 in 1939, 700,000 in 1944); some of the most important (in alphabetical order) are Admiralty, Ministry of Agriculture and Fisheries, Air Ministry, Assistance Board, Ministry of Civil Aviation, Colonial Office, Board of Customs and Excise, Dominions Office, Ministry for Economic Affairs, Ministry of Education, Ministry of Food, Foreign Office, Ministry of Fuel and Power, Ministry of Health, Home Office, Board of Inland Revenue, Ministry of Labour and National Service, Ministry of National Insurance, Ministry of Pensions, Post Office, Scottish Office, Stationery Office, Ministry of Supply and Aircraft Production, Ministry of Town and Country Planning, Board of Trade, Ministry of Transport, Treasury, War Office, Ministry of Works. The Cabinet has the ultimate control of these depts. in so far as any control is exercised over them; but of course that control is more evident in the case of what may be termed policy depts. than in those which in effect run themselves. The minister has the task of explaining to Parliament what his dept. is doing if Parliament asks questions about it; he is not allowed to blame the staff if matters go wrong; the responsibility for the doings of his dept. is his and he must shoulder it. Hence the civil servants must serve the minister loyally and carry out his decisions, and

the decisions of senior officers acting on behalf of the minister. In this latter connection it is a moot point how far senior officers have any actual share in shaping gov. policy; but it seems clear that their experience of every aspect of any given question must at the least be of the greatest value to a minister and especially to a new minister. When, after a general election, a new party comes into power in Parliament, and new ministers take office, the C. S. may find itself carrying out measures antithetical to those it has carried out in the recent past. But this is all in line with the traditions of the service and in accord with parl. democracy. But of course, in many aspects the work which falls to the civil servant does not change with a change of gov. Large parts of the administration of the country, particularly the routine work which is done by many in the C. S., are concerned with matters which obviously can only be done in one way, or on which Parliament has no strong views one way or the other, matters which do not arouse any political controversy.

In former times appointments to the C. S. in Great Britain were in the gift of the executive gov., and were obtained by influence. No qualifying examination was held, unless there were more nominations than there were posts vacant. When an appointment was made it was, as a rule, permanent. This system led, as may be imagined, to extraordinary inefficiency and favouritism; but it was not until 1870 that the system of open competition was introduced. Most of the posts in the service are now filled in this manner; but following both world wars arrangements relating to certain examinations were adjusted to the fact that the younger men had been required or would be required to undergo a period of military training at an age when they would normally be serving their apprenticeship as civil servants.

There are four main classes of the C. S., employed in nearly every dept.—administrative, executive, clerical, and the class of clerical assistants, typists, and shorthand typists. Then there are minor general classes; but equally important are the more specialised classes—scientists, lawyers, doctors, engineers, architects, actuaries, etc.; and a vast number of classes confined to one particular dept., e.g. the Tax Inspectorate working under the Board of Inland Revenue, the regional and local staff of the Ministry of Labour and National Service, including employment exchange managers, etc., the telephonists and telegraphists of the Post Office, and many others.

The *Administrative* class is a small one—before the Second World War its total size was approximately 1500; but in future it will probably be much larger by reason of the multiplicity of new depts. It is responsible for advising ministers on policy—that is, on problems which arise in deciding the general lines on which the country ought to be governed; on new proposals which ought to be put before

Parliament; and on how best to effectuate Parliament's wishes. It is responsible also for dealing with the difficulties which arise in carrying out existing policy; for forecasting the probable effects of new Acts and regulations; and for organising and directing the work of depts. It has, in addition, to assist ministers in their parl. duties—e.g. by preparing 'briefs' for speeches and answers to parl. questions and to letters from M.P.s, etc. White Papers, i.e. papers embodying policy, are drafted by senior civil servants. Most members of the administrative class are employed at headquarters offices, where policy is usually formulated, but in some depts., either as part of their training or because the exigencies of the service demand it, they may spend part of their career in regional or local offices. The junior grade of the administrative class is called assistant principal, and in normal times most entrants come to it at the age of twenty-two or twenty-three, after having taken a univ. degree, though there are also opportunities of promotion to it from other grades within the C. S. The examination is divided into two sections: the first, which is compulsory for all candidates, comprises essay, Eng., everyday science, auxiliary language, and viva voce. In the second section there is a comprehensive list of subjects from which the candidate elects up to a potential total of 1000 marks. It is a training grade, and its members spend most of their time in drafting letters, writing minutes, summarising information, and suggesting action on particular problems. After a few years they may serve as private secretaries to ministers or to senior civil servants. The next grade is principal, and at this level decisions on less important questions of administrative policy are taken. Next there is the grade of assistant secretary, usually in charge of a div. of the office; and higher still there are under-secretaries and the permanent heads and deputy heads of depts., who are concerned in major questions of policy. Normally an entrant to the administrative class may expect to rise in due course to the grade of assistant secretary; some, of course, will rise to the very top. Successful candidates at the administrative examination are normally appointed to salary scales as follows: men, £275 + £25-£325 + £30-£625; women, £275 + £25-£510. The highest salary (up to 1946) payable to permanent secretaries of the major ministries was £3000 per annum, with the exception of the permanent secretary of the Treasury, a post which also carries the title Head of the Civil Service and a salary of £3500 (now £3750) per annum. The *Executive class*, which stands next in importance to the administrative, carries out the higher work of supply and account depts. and specialised branches of the service. The examination for entry into the lowest grade of this class is based on a syllabus equal to the standard at the end of a secondary school course and candidates must be over

nineteen. Executive staffs in the services (Admiralty, War Office, and Air Ministry) depts. differ in that women are, ordinarily, ineligible, that service abroad is probable, and that the full London scale of salary is paid wherever the officer is employed, while prov. executives receive 5 per cent less. The audit staff is concerned with the issue of money from the Exchequer and the auditing of accounts of other depts., and assistant auditors are required to undergo a course of accountancy in their own time, but at gov. expense, before advancement. The examining staff, Estate Duty Office, is responsible for assessing and collecting estate and other death duties, and candidates require a knowledge of legal principles. Assistant examiners are required to obtain a univ. degree in law or to be called to the Bar before promotion. The actuarial staff comprises those who carry out actuarial work in connection with unemployment and health insurance and contributory pension schemes, old age pensions, friendly society valuations, and the like. A training in actuarial science is necessary and candidates for promotion are required to pass the examination of the Faculty of Actuaries. The scales of pay in the executive class are, for men, £100 + £10-£130 + £15-£400 a year; for women, £100 + £10-£300 a year. Above the basic grade the executive hierarchy consists of higher executives, senior executives, and in a number of depts. posts generally termed super-executive posts. The executive class numbered about 18,500 before Second World War and is expected to be larger in the future.

The *Clerical class* is the largest of the main classes of the service; before the war it numbered about 77,000. Its members undertake ordinary clerical work, the preparation of accounts and statistics, the management of official records, etc., and a good deal of interviewing when members of the public call. The clerical class is organised differently in different depts., but in the majority of depts. the junior grade (which is entered from school between the ages of sixteen and seventeen, or by promotion from lower grades) is known as clerical officer, the next as higher clerical officer, and the senior grades as staff officer and senior staff officer. In some cases higher clerical officers, staff officers, and senior staff officers are occupied in supervising junior clerical staff; they are the co-ordinators who see that the routine work of the service is completely done. The normal career for an entrant to this class goes up to higher clerical officer, though for the best there are fair chances of rising to at least staff officer; and there are opportunities of promotion to the executive class. The scales of pay for the general clerical class are men, £85 (at entry); £105 (at age eighteen) + £15-£120 + £10-£130 + £15-£160 + £12-£196 + £18-£214 + £12-£350, with an efficiency barrier at £250; women, £85 (at entry); £105 (at age eighteen) + £15-£120 + £10-£130 + £15-£160 + £5-£170 + £7 10s.-£185 + £10-£280, with an efficiency barrier at £195.

Clerical Assistant, Typist, Shorthand-Typist.—This class is now confined to women recruited between the ages of sixteen and seventeen (for clerical assistants) or sixteen and twenty (for shorthand-typists and typists); before 1939 men were sometimes appointed to routine clerical posts (generally known as S class clerks). Clerical assistants do the simple clerical duties, such as copying, keeping card indexes, preparing simple accounts. Typists have opportunities of promotion to shorthand-typist, and all these grades have opportunities of promotion to the clerical officer grade, normally within the first ten years of their service. The scales of pay are 28s. at 16; 31s. 6d. at 17; 35s. at 18; 38s. 6d. at 19; £2 2s. at 20; thence by 3s. to 57s.; thence by 2s. 6d. to 72s.—efficiency barrier at 57s.

Every new entrant to the estab. C.S. has to serve a period of probation, one year or two years according to grade, with extension in certain cases. Until this period of probation has been satisfactorily completed, the new entrant is not finally appointed to the C. S., and any one who during probation shows himself or herself to be really unsuited for C. S. work will be dismissed. Temporary staff are usually appointed for a period of trial in the first place, and may be dismissed at any time; the period of notice to be given is prescribed when they are appointed.

Pay.—The rates of payment mentioned above are those which were in use during 1914 plus a bonus governed by a sliding scale, which is regulated by the standard cost of living. In 1920 this was assumed to be 130 per cent (at one time the figure reached 176 per cent) higher than in 1914. Additions and deductions made subsequently affected one twenty-sixth part of the bonus for every 5 per cent of rise or fall in the basic rate. A sliding scale arrangement, under which the cost of living bonus was increased or diminished as the index figure of price levels rose or fell, was agreed upon on the National Whitley Council. This arrangement endured until the advent of the Labour Gov. in 1929. During the earlier part of the period 1929-31 reductions which would have been justified by the terms of the cost of living agreement were not, or were only partially, applied. Towards the end of this period the financial stringency which supervened led the gov. to impose the cuts and by March 1931 the service was being paid on the figure appropriate under the agreement—namely 55. About the same time the report of the royal commission on the C. S. was pub. This dealt, *inter alia*, with the bonus problem, and recommended consolidation on terms. In 1932 the bonus was stabilised, by agreement, at 50 until April 1934, when the gov. proposed to apply consolidation of bonus with salary. Bonus so stabilised continued to apply until 1st July 1934, as from which date consolidation was applied, or, in other words, the gov. decided at consolidation bonus with basic pay not to bring the bonus system to an

end. The bonus rate diminished as the salary became higher until in the case of persons in receipt of £2000 a year it ceased to operate. In the Second World War after some time a bonus was allowed to some classes and later extended to all civil servants but with a ceiling of £2000, as before. Since Feb. 1944 the C. S. war bonus, in operation since Feb. 1940, is included with salary for purposes of calculating pensions. No bonus was added, during the Second World War, to C. S. salaries above £1500. The gov. therefore decided in 1945, in view of the 'additions which had been made to the emoluments of many of the higher salaried personnel in employments comparable with the civil service,' to increase the salary of heads of depts. from £3000 (the 1920 maximum) to £3500; and also to increase the salaries of deputy secretaries of major depts. from £2200 to £2500. Increases were also made to the salaries of under-secretaries and assistant secretaries. The salary structure of the administrative class under this reorganisation is as follows: head of major dept., £3500; deputy head, £2500; under-secretary, £2000; assistant secretary, £1200-£1700 (scale); principal, £800-£1100; assistant principal, £275-£625. The last three scales are subject to the addition of war bonus (at present £60 per annum, payable on all C. S. salaries up to £1500).

There has never been any clearly defined method of recruitment to many of the technical and professional posts, but some years ago the gov. appointed a committee (known as the Carpenter Committee) with the view of reaching more uniformity in the scales of pay and general conditions of staffs doing work of equal quality and requiring the same types of qualifications in the different depts. The recommendations of this committee produced a scheme which is used in some depts. This scheme covers civil servants employed in scientific research and development and chemical establs., the basic rates of pay being: prin. scientific or technical officer and prin. chemist, £850 + £30 = £1050 (women, £700 + £30 = £880); senior scientific or technical officer and senior chemist, £680 + £25 = £800 (women, £580 + £25 = £680); scientific officer, £400 rising to £580, with an efficiency bar, and then up to £680 (women, £350 to £464 and then to £580); junior scientific officer, technical officer, and chemist, commencing salary £275, rising (subject to efficiency bar at £455) to £680 (with lower rates for women); and ancillary staff, comprising assistants I., II., and III., with initial salaries of £400, £315, and £130 respectively. The qualifications required for appointment to the basic grades of these two classes are (a) junior scientific officer, technical officer, and chemist—an honours degree or its equivalent; (b) assistant III.—Inter. B.Sc. or its equivalent. Another general class in the professional and technical area is that of architectural and civil engineering assistants who are employed in the Admiralty, Air Ministry, Ministry of

Transport, Ministry of Works, Post Office, Ministry of Education, and Board of Control. The scales of pay for these staffs are: architectural and civil engineering assistant, Grade III., £210, rising to £320; Grade II., £320, rising to £420; and Grade I., £450, rising to £550.

The general administration of the C. S. is under a special dept. of the Treasury, which, however, usually acts with the dept. affected. The superannuation allowances of the C. S. bear a relation to the number of years of service. Service may conclude at any time through ill health, or voluntarily at sixty and compulsorily at sixty-five. In 1929 a royal commission was appointed to deal with new problems that had arisen in connection with the different rates of pay and superannuation allowances between men and women and also between recognised employees and those who, though temporary workers, continued in the service till compulsorily retired at sixty-five. In the case of many receiving about £3 5s., who received no pension but a small gratuity, it was felt there was much hardship. The Sex Disqualification Act of 1919, which placed women on an equality with men in many privileges and liabilities, contained a special clause under which the position of women in the C. S. was still left somewhat indefinite; but in 1921 a resolution was accepted by the gov. which placed women on equal terms with men.

C. S. remuneration, which, in the light of a gov. decision of 1934, must 'reflect the long-term trend of wage movements outside,' is not on the excessive side. The most senior civil servant, the permanent secretary of the treasury, receives £3500 per annum (since raised under Cmd. 6680) for 'undertaking responsibilities which, in the commercial world, would attract a salary four- or fivefold this amount, and indeed there are many cases at almost every range in the civil service who have been offered and in many cases have accepted posts outside with salaries which, compared with what they were paid in the service, are almost magnificent' (W. J. Brown, M.P.).

Regulation of Civil Service Conditions.—Most branches of the C. S. have their own associations, which in many cases are recognised when questions of difficulty and dispute arise. The Industrial Courts Act of 1919 estab. a court to deal with claims affecting emoluments, hours of work, and leave, but these matters are here treated on broad issues and are not for hearing specific cases. There are associations and unions constituted to accommodate every civil servant from the highest administrative official to the member of the most subordinate grade. Many of these organisations, such as the C. S. Clerical Association and the Union of Post Office Workers, have huge memberships extending to six figures, with branches all over the kingdom, and with full-time union officials to administer the organisation's affairs. There are many other smaller organisations, some of which are also administered by persons not actually

in the C. S., while others of the smaller type are under the direction of serving civil servants who devote their spare time to this work. It is with such unions of this sort as have been officially recognised by the gov. that negotiations take place to settle the conditions of employment of particular classes of civil servants. There are many subjects, however, in which almost all civil servants have a common interest, e.g. the arrangements about superannuation and sick leave and the mode of handling serious disciplinary cases. It is to deal with general questions of this sort that Whitley Councils have been instituted in the C. S. The main body of this kind is in the National Whitley Council. This body consists of an official and a staff side. The official side contains a number of the highest officials in the C. S. who speak in the name of the gov., whilst the staff side consists of nominees of the more important C. S. trade unions or associations. The agreements reached with the National Whitley Council are binding on the administration and the staffs of all depts. In addition there is in almost every dept. a departmental Whitley Council with its official and staff side; these departmental Whitley Councils cannot legislate on matters affecting the C. S. as a whole as can the National Whitley Council, but they are competent to deal with questions affecting the staffs of the particular dept. concerned. Finally, there is an independent court of appeal to which disputes about pay, hours, and certain other conditions can be referred. This is the Civil Service Arbitration Tribunal, which consists of an independent chairman nominated by the minister of labour and two other persons. Individual persons cannot take their disputes to this tribunal, which is available to Whitley Councils and recognised staff organisations.

Quality and Traditions of the British Civil Service.—The quality and traditions of the Brit. C. S. are high and have made a marked contribution to the national life. Yet the service is almost entirely the product of last century, having grown and developed at a great rate. The general constitution of the service and the method of recruitment 'have been well designed to attract men of the right type for the duties which they have to perform,' though it is not a career which appeals very strongly to an ambitious man. The estab. Brit. civil servant enjoys a measure of security which excites at times the envy and indeed criticism of the employee in the commercial world; but in consideration of this security of tenure most responsible civil servants show the qualities of loyalty and discretion in a high degree and it has been caustically said that 'incompetent ministers sometimes remain in office longer than they deserve through the protective loyalty of their permanent officials' (C. K. Allen). Again, an obvious characteristic of the Brit. civil servant is his incorruptibility, a reputation he enjoys not only in his own country but also abroad. But if the Brit. civil servant has

these merits, there are, *per contra*, defects which in the public mind have earned him the invidious label of bureaucrat. The Committee on the Training of Civil Servants in 1944 summed up the popular criticism in these words: 'While the defects commonly attributed to it are not the monopoly of the civil service, it may be that the conditions of the public service tend to foster particular weaknesses and to throw the limelight of publicity upon them to a greater degree than elsewhere. The faults most commonly enumerated are over-devotion to precedent; remoteness from the rest of the community; inaccessibility; and faulty handling of the general public; lack of initiative and imagination; ineffective organisation and misuse of man power; procrastination and unwillingness to take responsibility or to give decisions. We recognise that these defects exist in some measure—though not so generally or in such degree as is often alleged—and whether they derive from the individual or the system, post-entry training must be directed to eliminating them' (Cmd. 6525). Two years previously to the issue of this report the Select Committee on National Expenditure considered the organisation and control of the C. S. In a report pub. in Nov. 1942 that committee recommended periodical overhauls of the machinery of government, and the estab. of a C. S. staff college to provide theoretical and practical training and refresher courses for picked civil servants after a few years' service. 'The evils of bureaucracy, and, in particular, its tendency to arbitrariness,' says Dr. Allen, 'do not spring from the sinister designs or the perverted views of individuals. They spring from the inherent and insidious characteristics of the system. And for the system it is not the civil servant, and it is not even Parliament, who is responsible. It is the nation. Let it, by all means, be properly informed of what is happening; but, so informed, it cannot escape its responsibility.'

See *Report of the Royal Commission on the Civil Service* (chairman, Lord Tomlin) (Cmd. 3909), 1931; N. E. Mustoe, *The Law and Organisation of the British Civil Service*, 1932; W. A. Robson (ed.), *The British Civil Servant*, 1937; R. W. Harris, *Not So Humdrum*, 1939; H. E. Dale, *The Higher Civil Service of Great Britain*, 1941; *Organisation and Control of the Civil Service* (sixteenth report from the Select Committee on National Expenditure) (H.M.S.O.), 1942; E. N. Gladden, *Civil Service Staff Relationships*, 1943, and *The Civil Service: its Problems and Future*, 1945 (the greater part was written before 1939); *Report of the Committee on the Training of Civil Servants* (Cmd. 6525), May 1944; C. K. Allen, *Law and Orders* (especially chap. viii.), 1945; R. Warner, *The Principles of Public Administration*, 1948.

Civil War (1642-49), see under **ENGLISH HISTORY**.

Civil War, American, see **UNITED STATES, History**.

Civita (from Lat. *civitas*), It. word

meaning city. It is the same as the Sp. *ciudad*, and forms part of sev. names of places in Italy, such as *Civitavecchia*, etc.

Civita Castellana, tn. of Italy in the prov. of Rome, 19 m. S.E. of Viterbo. It is a most picturesque tn., situated high on a rock, with an old citadel (1500) and a thirteenth-century cathedral. Near by are the famous Etruscan ruins of the anct. city of Falerii, which comprise a theatre, gateways, and towers, and some excellent specimens of anct. military architecture. Pop. 3200.

Civitanova, com. of Italy, prov. Macerata, pop. 7000. Its port called Porto di C. on the Adriatic is now an independent com., pop. 8000.

Civitas Cemeneliensis, see **CIMIZ**.

Civitavecchia, fortified seaport of Italy, situated on the Mediterranean, 50 m. N.W. of Rome by rail. The port, which is one of the best in the country, was built by Trajan. The city is on the site of Centum Cellæ, and has been besieged, destroyed, and taken sev. times. It is the tenth among It. ports. There is an important arsenal. Michelangelo's Fort was badly damaged in the fighting of 1944. The museum, too, was badly hit, but the most valuable of the contents had been removed to safety before the fighting began; and the public library and contents were severely damaged. The tn. fell to the allied Fifth Army on June 8, 1944. Pop. 32,000.

Civitella del Tronto, tn. of Italy in Abruzzi e Molise in the prov. of and 10 m. from the tn. of Teramo. It is situated on a high rock, which is capped by a castle. Pop. (com.) 9300.

Civitella di Romagna, mrkt. tn. of Italy in Emilia, in the prov. of Forlì. Pop. 7500.

Civray, tn., Vienne, France, on R. Clarente, 30 m. S. of Poitiers. The anct. Severiacum. Pop. 2200.

Clackmannan, cap. of the co. of that name, situated on the Devon, 2 m. from Alloa. There is an anct. market cross, and in the near vicinity is a ruined tower of the Bruces. Pop. 1500.

Clackmannanshire, smallest co. in Scotland; bordered on the S.W. by the Forth, it lies between Perth, Fife, and Stirling. It is 10 m. long and 4 m. wide, with an area of 34,927 ac. The surface is varied. To the N. are the Ochil Hills, and the remainder of the country is somewhat level and extremely fertile. The Black Devon and Devon are the prin. streams, the latter being noted for its beautiful scenery. The soil is well cultivated; oats, wheat, and beans are the chief crops. Cattle and sheep are reared in great numbers. Much coal and iron abound, and small quantities of copper, lead, and silver are found. Coal has been worked for nearly two centuries, and there are large iron works, breweries, and distilleries. The chief tns. are Alloa, Clackmannan, Tillicoultry, and Alva. Woollen goods are manufactured at Tillicoultry, and in other parts glass-blowing, tanning, and shipbuilding are carried on. Pop. 33,000.

Clacton-on-Sea, seaside tn. in Essex with a beach sev. miles long, and a pier 1150 ft. in length at which steamers call daily during the summer. There is a promenade nearly 12 m. in length and a marine parade along the cliffs, an ann. regatta and wild-fowl shooting in the marshes, a recreation ground with a Jap. rock garden, a hospital and six convalescent homes, an orphanage, and a holiday home for blind and crippled girls. Pop. 16,000.

Cladium, genus of Cyperaceæ, consists of tropical and temperate plants which are extremely common in Australia. *C. Mariscus*, prickly twig-rush, which derives its name from the almost prickly margins of the leaves, these latter being themselves rough, is found in various parts of England, besides being abundant in parts of Scotland.

Cladocera, or **Water-fleas**, form a sub-order of branchiopod crustaceans characterised by having not more than six pairs of trunk-legs.

Cladonia, genus of fruticose lichens, has sev. Brit. species. The shape of its branches gives it the appearance of a bundle of small worms or of vernucelli. *C. rangiferina*, the reindeer moss, occurs frequently on moors, heaths, and mts. In Lapland it is the most abundant of all plants, and is found chiefly in pine forests, covering the soil for miles together; it forms the prin. support of the reindeer.

Claim of Right, The: 1. Act passed by the Scottish Estates in April 1689, stating the offences for which James VII. had forfeited the crown, and the terms on which it was accordingly offered to William of Orange. It enacted that in future no papist should rule over Scotland, and declared the necessity of frequent parliaments. 2. Petition made by a majority of the Scottish General Assembly in 1842 against patronage and sent to the Parliament of Westminster. It stated their feelings with regard to the relation of the State to the Church. The terms of the petition were not granted by the gov., and, accordingly, in the following year, 400 ministers seceded and formed the Free Church of Scotland.

Clairac, tn., France, in the dept. Lot-et-Garonne, situated on the r. b. of the R. Lot, 18 m. N.W. of Agen. It was the first tn. in S. France to declare in favour of the Reformation through the example of the abbot of the Benedictine Abbey, who turned to Protestantism in 1527. There is white wine production. Pop. 2300.

Clairaut, Alexis Claude (1713-65), Fr. mathematician. He produced at the early age of twelve a treatise on four curves of the second order; this, together with his *Recherches sur les courbes à double courbure* (1731), caused him to be elected a member of the academy when nineteen. His *Théorie de la lune*, which gained the prize at St. Petersburg Academy, explains the lunar apogee, which had been omitted by Newton. His *Théorie de la figure de la terre* (1743) expounds the theorem that the variation of gravity on the surface of the earth, regarded as an elliptic spheroid, is altogether independent of the law of

density. He also calculated the perihelion of Halley's comet.

Clairon (**Claire Joséphe Loris**) (1725-1803), celebrated Fr. actress, was b. near Condé in Hainaut. After playing in prov. tns. and foreign countries, she made her debut at the Comédie Française in the part of Phœdra. The time of her fame was 1743-66; she played many roles and excelled in Voltaire's tragedies. C. wrote her own memoirs (1798). There is also a life by Edmund de Goncourt, 1900.

Clairvaux, hamlet in the com. of Villers-la-Ferte, Aube, Franco, about 30 m. S.E. of Troyes. It is noted for its abbey, founded in 1111 by St. Bernard, after whose death it was improved and enlarged. It was suppressed at the revolution, and the building is now used as a prison. Pop. 700.

Clairvoyance, alleged faculty of being able to see objects not ordinarily visible to human eyes, and from these objects to describe events that are taking place at a distance. Such a faculty is said to be due to hypnotic power. See PSYCHICAL RESEARCH.



GIANT CLAM

Clam, term applied to many Eulamelli-branchiate molluscs varying in importance in different countries. In Scotland the scallops (*Pecten*) receive this name; they are edible creatures which swim by flapping the valves of their shells. In England the very various genera *Macoma* and *Mya* are known as Cs., *Mya truncata* being the soft C. The term largely applied in the U.S.A. to sev. species of bivalve molluscs of somewhat the same order as the Scotch scallops and the Eng. cockle. The name originates from the firm manner in which the creature closes its shell when alarmed. Two kinds are eaten in the U.S.A., the soft shell C. and the hard shell. The latter is sent in great quantities to the markets. It is eaten both raw and in a soup called C. chowder

The species are *Venus mercenaria* or hard C., and *Mya arenaria* or soft C. C.-shell is the Eng. name of the bivalve shells belonging to the molluscan genus *Tridacna*, and specially of *T. gigas*, which sometimes measures 2 ft. across. A pair of valves weighing upwards of 600 lb. were used as a receptacle for holy water in the church of St. Snipice, Paris.

Clamart, com. of France in the Seine dept., 5 m. S.W. of Paris. The chief industries are linen manuf. and stone quarrying. Pop. 33,800.

Clamecy, tn. of the dept. of Nièvre, France, at confluence of the Yonne and Beuvron, 38 m. N.E. of Nevers. Has a considerable trade in firewood. Pop. 5400; arron., 41,000

Clan (Gaelic *clann*, meaning children), early form of organisation, of which the Highland C. of Scotland was the most highly developed of recent times. The Scottish C. was confined to the Highland regions, and was composed of the common descendants of the same progenitor. The chief, who was usually one of the oldest members, represented this common ancestor, and exercised patriarchal control over the clansmen. The name of the C. was frequently composed of that of the founder, with the addition of Mac (meaning 'son of'); thus we have the C. MacDonald, the C. MacPherson, and similar names. Theoretically speaking, every Scotsman named MacDonald was a descendant of the original Donald, and brother to every other MacDonald. The chief of a C. thus ruled by the right of primogeniture, and was revered and obeyed by his clansmen. Each C. in Scotland occupied a separate portion of ter., and not infrequently bitter rivalry existed between the neighbouring Cs. The near relations of the chief were generally in the position of sub-chiefs, and exercised some authority, this was not very well defined, and any disputes which arose in consequence were referred to a council of the C. In the later years of the Cs. the Scottish Gov. made it a rule that every C. should supply at court a representative of rank to give security for their good behaviour. Should a C. refuse to do so, they were termed a 'broken C.,' and were proscribed and in a state of outlawry. The MacGregor C. was a notable example of such, holding their lands for long by the *cor* or glaive, or right of sword. The members of this C. who wished to earn their living in the lowlands were obliged to alter their name, which accounts for the variations found, such as Gregor, Gregory, and Grierson. The old Scots Acts always speak of the Cs. in terms of opprobrium. The rebellions of 1715 and 1745 were the means of inducing the Brit. Gov. to break up the Cs. Hereditary jurisdiction was accordingly abolished, the people were disarmed and forced to cease wearing their national costume, and at the present time few traces of the C. remain save in the persons of chiefs officially recognised as such by the inheritance of ancestral arms, and in the C. associations founded on sentiment.

Clan Line, Eng. steamship line. It started business in 1878, when steamers sailed fortnightly from Glasgow and Liverpool to Bombay and Karachi. Since then the company has extended its calling stations to all parts of the world. The company owns fifty steamships totalling over 200,000 gross tons. The C. L. controls the Brit. and S. Amer. Steam Navigation Co., and the Scottish Shire Line.

Clan-na-Gael, name of a secret society formed by Irish Fenians in the U.S.A. about 1883. Its object was to force the Brit. Gov. into giving Ireland home rule. The members of this society believed that the only way in which they could achieve their end was to terrorise the Parliament, as well as the public. The headquarters of the society was Chicago, but it had agents in England and Ireland, who were responsible for the assassinations and the dynamite outrages of 1883.

Clanvowe, Sir Thomas (fl. 1400), was a friend of Prince Hal. Prof. Skeat has attributed to him the authorship of *The Cuckoo and the Nightingale* (written about 1400-10), a poem which had long been thought to be by Chaucer. Wordsworth made a modernised version of it 'from Chaucer' in sixty-eight stanzas (1801).

Clanwilliam, tn. 135 m. N.E. of Cape Town in a fertile dist. producing corn and oranges. The gov. cedar forests are near. White pop. 350.

Clapham, two wards (N. and S.) in the metropolitan bor. of Wandsworth (q.v.), London. The station styled C. Junction does not serve C. at all, being wholly within the parl. div. of Battersea. C. Common, a public recreation ground of 200 ac., contains three large ponds.

Clapham Sect. The name hist. has given to the little coterie of intimate political friends, all humanitarians and all Evangelicals, most of whom lived in the then vil. of C. and whose dominant figure was Wm. Wilberforce. Next to Wilberforce, the most prominent member of this brotherhood of Christian politicians was Henry Thornton (1760-1815), like Wilberforce an independent-minded Tory, son of a successful banker who was a devoted disciple of the divine John Newton, co-author of the *Olney Hymns*. The large lofty oval-shaped library, designed by the architect Chatham, in Thornton's house was the usual meeting-place and club-room of the sect. Wilberforce lived in the house between 1792 and 1797 and for the ensuing ten years in a house called 'Broomfield,' the garden of which bordered on Thornton's house. Most of the fraternity were rich, living in large roomy houses, but they were all generous givers to the poor. The patriarch of the community was Granville Sharp (1735-1813), a much older man than most of the others and, relatively, too poor for a parl. career. He seems to have been the confidant and counsellor of the group. Next in seniority and also somewhat apart from the rest, was Charles Grant (1764-1823), a servant of the E. India Company and later chairman of the company's court of

directors and M.P. for Inverness-shire. He was father of Lord Glenelg, whose notorious colonial policy owed both its strength and weakness to its inspiration in C. ethics. The rest of the group were Zachary Macaulay (1768-1838), father of T. B. Macaulay and a well-known philanthropist, who played a leading part in founding the Brit. colony of Sierra Leone for liberated African slaves; James Stephen (1758-1832), a barrister of St. Kitts, who was early a coadjutor with Wilberforce in his abolitionist crusade and an M.P. between 1808 and 1815; Wm. Smith (1756-1832), Whig M.P. for Sudbury, Camelford, and Norwich, also an enthusiast for the abolition of the slave trade; the Hon. Edward James Elliot (1759-97), member for Liskeard; John Venn (1759-1813), the preacher and vicar of C. at whose par. church, as the tablet there shows, the brethren of the sect congregated for Sunday worship; and John Shore (1751-1834), and Lord Teignmouth (q.v.), a great friend of Warren Hastings and later governor-general of India. Among other intimates, who did not live at C. but were constant guests of those who did, were the Rev. Isaac Milner, dean of Carlisle (1751-1820) (q.v.); the Rev. Thomas Gisborne, vicar of Yoxall and a lifelong intimate friend of Wilberforce; Thomas Babington, a zealous abolitionist and collaborator with Wilberforce; and Thomas (Clarkson) (q.v.) the anti-slavery agitator, whose share in the abolition of the slave trade and of slavery was hardly less than that of Wilberforce himself. The fraternity was remarkable for its affinity. It not only lived for the most part in one vil.; it had one character, one mind, and one way of life. They were all what Wilberforce meant by 'true Christians.' And as if to make them still more like a single family, many were related by marriage. Thus, Thornton's mother was an aunt of Wilberforce. Stephen married Wilberforce's sister, Gisborne Babington's, Babington Macaulay's. 'It was doubtless this homogeneity that gave the group its power in public life. They might differ on party issues; but on any question of religion or philanthropy, above all on the tremendous issue of the abolition of the slave trade, the voice of the 'Saints' in Parliament or in the press was as the voice of one man.' See R. and S. Wilberforce, *Life of Wilberforce*, second ed., 1930; Sir J. Stephen, 'The Clapham Sect' in *Studies in Ecclesiastical Biography*, 1849; J. S. Harford, *Reollections of Wilberforce*, 1865; J. C. Colquhoun, *William Wilberforce, his Friends and his Times*, 1866; and Sir R. Coupland, *Wilberforce*, 1945.

Clapiers, Luc de, see VAUVENARQUES, MARQUIS DE.

Clapperton, Hugh (1788-1827), Scottish explorer, b. in Dumfriesshire, and running away from home at the age of thirteen, went to sea. He accompanied Dr. Oudney and Denham on their exploring expedition by way of Tripoli and Murzuk to Kuks, on Lake Chad, which was reached in 1822, and thence to Sokoto, returning to England in 1825. The

results of this expedition had been more of an anthropological than a geographical nature, so in Aug. 1825 a second expedition set out from the bight of Benin to determine the course of the Niger. All the members of this expedition perished save Richard Lander, C. being the last to die, at Changary, near Sokoto.

Clapton, residential dist. of N.E. London, England, in the bor. of Hackney. John Howard, the philanthropist was b. here.

Claque (Fr. *claque*, to clap), body of men hired to applaud in theatres, and thus ensure the success of a play. According to Suetonius, the Emperor Nero had 5000 paid applauders who attended the performances of his plays. From the Rom. origin of the custom, the *claqueurs* are sometimes called *romains*. The C. became an openly organised institution in Paris towards the end of the eighteenth century. The leader, upon whom the responsibility rests, is called *entrepreneur de succès dramatique*, and under him are *pleureurs* (weepers), *bisseurs* (who cry his, or encore), and *ricours* (laughers), etc. The Théâtre Français and the Grand Opéra, with a few of the leading Parisian theatres, have with more or less success abolished the C. from their houses.

Clare, maritime co., Eire, in the prov. of Munster, situated between Galway Bay on the N. and the Shannon estuary on the S. C. is the seventh of the Irish cos.; its length is 67 m. and the greatest breadth 43 m., the average breadth being 21 m. The surface is very irregular; there are mts. in the E., W., and N.W., whilst the centre is occupied by an undulating plain which runs from N. to S. The chief ranges of mts. are the Slieve Boughda Mts., which lie partly in Galway, and the Slieve Bernagh Mts.; the chief rivs. are the Shannon and the Fergus. Oats, potatoes, wheat, and barley are grown, slate and black marble are worked and the rearing of sheep and cattle is largely carried on. Limestone, lead, and slate are found, and beds of carboniferous limestone. There are as many as a hundred small lakes, and many chalybeate springs; the salmon fisheries are of importance, and in the N. are extensive oyster beds. The chief tns. of the co. are Ennis, the cap., Kilrush, Ennistimon, and Killaloe. Until the time of Elizabeth, C. was called Thomond; it derived its present name from Thomas de Clare, to whom was given all the land in the dist. that he was able to conquer. Area, 768,265 ac.; pop. 95,000.

Clare: 1. Tn. of England in Suffolk, on the R. Stour, 12 m. from Bury St. Edmunds, on the E. Region of Brit. Railways. It has an old castle, formerly the seat of the earls of C., and an Augustinian priory of the thirteenth century. Pop. 1400. 2. Tn. of S. Australia in Stanley co., chiefly noted for its vineyards and orchards. Pop. 1600.

Clare, John (1793-1864), Eng. poet, the son of a poor labourer. He was b. at Helpstone, near Peterborough, and has often been called the 'Northamptonshire peasant poet.' At the age of seven he was employed on a farm, and later received a

post as under-gardener, but in 1812 he ran away and joined the militia. For a time he lived with gipsies, then worked as a burner on a lime-kiln, but, being dismissed, was obliged to seek for par. relief. C. was fond of learning old songs, and when very young scribbled verses of his own. His inspiration came from Thomson's *Seasons*, and all his poems deal with out-of-door life and farm scenes. *Poems Descriptive of Rural Life and Scenery* (1820) was well received, and was followed in 1821 by *The Village Minstrel*. C. was helped by men of influence and rank, by whom he was received as a friend, but to the end of his life was poor. The *Shepherd's Calendar* (1827), and the *Rural Muse* (1835), were not so successful, though the latter brought him £40 and was praised by Christopher North. He d. in the co. asylum, Northamptonshire, where he composed his last poem, *I am: yet what I am who cares or knows?* See biographies by F. Martin, 1865, and J. W. and A. Tibble, 1932, and especially *Sketches in the Life of John Clare*, written by himself and ed. by Edmund Blunden (1930). The fullest and best collection of C.'s poems is by J. W. Tibble, 1935.

Clare, John Fitzgibbon, first Earl of (1749-1802), lord chancellor of Ireland. He was an antagonist of Grattan, strongly opposed Rom. Catholicism, and promoted the Union. He was raised to the peerage in 1795.

Clare, St. (1191-1253), founder of the order of Poor Clares. She came of a noble family of Assisi; but, through the influence of St. Francis, she gave up her wealth and her social life. At his advice, she founded her order, the Franciscan order for women, in 1212. St. C. was canonised two years after death by Pope Alexander IV. See P. Robinson (ed. and trans.), *The Life of St. Clare* (ascribed to Thomas of Celano), 1910.

Clare Hall, one of the colleges of the Cambridge Univ. It was first founded in 1326 as 'Univ. Hall,' but the building was destroyed by fire in 1342. It was rebuilt by Elizabeth de Burgh, countess of Clare, who in 1347 founded the new college, which was called C. H., for the purpose of educating clergy to take the place of those who had died during the plague. The present building dates from 1638, and the new chapel was consecrated in 1769. Outworth was master of C. and among its noted fellows have been Bishop Latimer and Archbishop Tillotson.

Clare Island, is. off Mayo, W. coast of Ireland, at the mouth of Clew Bay. Length, about 4½ m.; area, 3946 ac. The vil. of Westport stands on its W. coast, and a lighthouse on the N.W. Pop. 500.

Claremont: 1. Municipality of Cape Province, 6½ m. from Cape Town. The National Botanical Gardens of S. Africa in surroundings unsurpassed for grandeur are approached from here. The municipal gardens contain a famous collection of trees. Sir John Herschel's observatory formerly stood here. Pop. (white) 6000. 2. Tn. in Sullivan co.,

New Hampshire, U.S.A., on the Sugar R. and on the Boston and Maine railroad. It manufs. machinery, cotton, and woollen goods, paper, shoes, etc. Pop. 12,100.

Claremont Park, royal seat in Surrey, belonging to the Epsom div., 5 m. S.W. of Kingston. It was originally built by Sir John Vanbrugh in the eighteenth century, and has since been the residence of Lord Clive, Louis Philippe of France (d. 1850), Princess Charlotte of Wales (d. 1817), and in 1882 it became the property of Queen Victoria.

Clarence, Eng. ducal title, sometimes conferred on a younger member of the royal family. It was first held by Lionel (1338-68), the third son of Edward III., in 1362, on the occasion of his marriage with Elizabeth de Burgh. Other notable dukes of C. are Thomas (1389-1421), second son of Henry IV., who d. at the battle of Beaugé; George (1449-78), brother of Edward IV., who d. in the Tower; William IV. (1765-1837), previous to his accession; and Albert Victor Christian Edward (1864-92), the eldest son of King Edward VII.

Clarenceux, or **Clarenceux**, Eng. heraldic officer, being the first of the two prov. kings-of-arms. His jurisdiction lies over England S. of the Trent, and it is his function to inspect the arms of all those who live within his prov. He may also grant arms with the sanction of the earl marshal.



LORD CLARENDON

Clarendon, Edward Hyde, first Earl of (1609-74), statesman and historian, was a prominent figure in the reigns of the two Charleses. In the Long Parliament he gave valuable support to the cause of the king. He assisted in the impeachment of Strafford, and vigorously opposed measures designed to limit the monarch's authority. With Falkland and Colepeper he formed what was for all practical

purposes the king's advisory council, but Charles I., determined to go his own way, and knowing the triumvirate would not approve, did not inform it of his intention to arrest the five members. After the death of Charles I. C. became one of the prin. advisers of Charles II., and went with him into exile. At the Restoration he was created Baron Hyde, and in the following year earl of C. He was appointed lord chancellor in 1658, and the appointment was confirmed when the king came into his own. His importance was enhanced by the marriage of his daughter Anne to the duke of York, heir-presumptive to the throne. As a minister he was unpopular, and in 1667 he fell from his high estate, the victim of a court cabal. In the same year he was impeached, but though the Lords did not convict him, he went abroad, where he remained during the rest of his life. There he finished his *History of the Rebellion*, which was pub. posthumously (1702-4). There are biographies by Thomas Lister, 1837-38; Sir C. H. Firth, 1909; and Sir H. Craik, 1911.

Clarendon, George William Frederick Villiers, fourth Earl of (1800-70), Eng. statesman and diplomatist. Ambas. to Madrid in 1833, but returned to England on the death of his uncle (1838), when he succeeded to the title. In 1840 he was made lord privy seal in Melbourne's ministry, and became chancellor of the duchy of Lancaster. In 1847 he was lord-lieutenant of Ireland, and displayed rare tact in quieting the Smith O'Brien agitators. Consult his life in P. M. Thornton's *Foreign Secretaries of the Nineteenth Century*, vol. iii., 1881-82; and Sir H. Maxwell, *The Life and Letters of the Fourth Earl of Clarendon*, 1913.

Clarendon, Constitutions of, were laws, passed in 1164 by a council of bishops and barons, at the hunting-lodge of C., near Salisbury, by means of which Henry II. was enabled to check the power of the pope in England. The constitutions were sixteen in number, the chief enactments being that titles to eccles. estates and the election of church dignitaries lay within the prov. of the Crown; that no beneficed clergyman might leave the country without the king's consent; and that no appeal to Rome could be presented without the consent of the *curia regis*. Pope Alexander III. refused to ratify the constitutions, and the quarrel which resulted between Henry and Becket led to the murder of the latter.

Clarendon Park, formerly a royal forest of England, in Wiltshire, 2½ m. from Salisbury. The remains of the royal hunting seat, where Henry II.'s council enacted the constitutions of Clarendon (1164), may still be seen.

Clarendon Press, former name of the press of the univ. of Oxford. It has been known since 1830 as the Oxford Univ. Press, and is now largely a commercial firm, in which the delegates of the univ. have a considerable influence. It was founded in 1672, and had its first home in the upper part of the Sheldonian theatre at Oxford. In 1711-13 a new printing

house was erected for it by Sir John Vanbrugh a little to the N. of the theatre and flanking Broad Street. The name came from the funds being provided by Lord Clarendon's *History of the Rebellion*, the perpetual copyright of which was given to Oxford Univ. by his son. This building was appropriated for use as a museum and lecture rooms, and the present Oxford premises of the press in Walton Street were erected by Blore and Robertson in 1825-30. All the subsidiary processes of book production, including type-founding and stereotyping, are done by the firm on its own premises, while paper is supplied by the univ. mills at Wolvercote. The C. P. carries out within its own walls the whole process of the production of Bibles, of which it has the right by royal patent. Together with the Cambridge Univ. Press, it purchased the entire copyright of the R. V. (1881-1885), and the Oxford Press alone sold over a million copies of the N.T. on the day of publication. By an Act of Parliament (15 George III., chapter liii.), the press has the perpetual copyright of all works belonging to it, and later given or bequeathed to it, provided such are printed on the univ. presses. This was confirmed by the Copyright Act (5 and 6 Victoria, chapter xlv).

Clarens, vil. of Switzerland in the canton of Vaud, on lake of Geneva, 3½ m. from Vevey. It has a mild, pleasant climate in winter, and is therefore much frequented by persons suffering from tubercular troubles. Altitude 1245 ft. With other vils. it forms the dist. of Montreux, which has a pop. of about 15,000.

Claret, name used in England to denote in general the red wines of Bordeaux. Bordeaux wines are produced in the prov. of Gironde, one of the best known coming from Médoc. Other celebrated clarets come from the vineyards of Châteauneuf-Lafite, Châteauneuf-Margaux, and Haut-Brion. In France the word *claret* was applied to light-coloured red and yellow wines to distinguish them from *vins rouges* and *vins blancs*. The word C. is not known in that country. See WINE.

Claretie, Jules (properly Arsène Arnaud) (1840-1913), fr. novelist, playwright, and journalist, b. at Limoges, Haute Vienne. He acted as war correspondent during the Franco-Prussian war; dramatic critic to *L'Opinion Nationale*, 1867; and had great influence as a political writer. His plays of the revolution—*Les Muscadins* (1874); *Le Régiment de Champagne* (1877); *Les Mirabeau* (1879)—were extremely popular. His novels include *L'Assassin* (1866); *Madeleine Bertin* (1868); *Le Train 17* (1877); *Monsieur le Ministre* (1882); *Le Prince Zilah* (1884); and *L'Accusateur*. He also wrote extensively on historical subjects: *Cinq ans après* (1877); *Les Prussiens chez eux* (1872); *La Vie à Paris* (1886). A complete ed. of his works was pub. 1897-1904.

Clarges, Sir Thomas (d. 1695), was a politician. He was first in the service of Richard Cromwell, and then became a supporter of Monk in his plans for the restoration of Charles II.

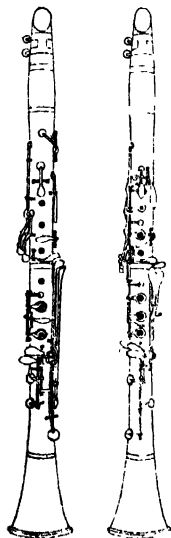
Claribel, pseudonym of Mrs. Charlotte Allington Barnard (1830-69), ballad-writer. She was b. in London, and became a pupil of Madame Parepa and Signor Mario. She wrote many songs and ballads that were very popular, such as *Come back to Erin*. These were pub. in vol. form as *Fireside Thoughts, Ballads, etc.* (1865), and *Thoughts, Verses, and Songs* (1877).

Clarification, process of refining a liquid by separating or removing the substances which make it turbid. This can be done by straining through a sieve; by using a centrifugal or circular vessel, with a small outlet in the centre, which, when revolved at a high speed, will clear the liquid by lifting the particles of foreign matter to the surface; and by adding to the liquid gelatine, white of eggs, bullocks' blood, etc.

Clarichord, see CLAVICHORD.

Clarimontium, see also CLERMONT-FERRAND.

Clarinet (It. *clarinetto*, from Lat. *clarus*, clear), musical instrument akin to the clarion (q.v.). It is supposed to have been first made after 1690 by Johann Christopher Denner of Nuremberg, who probably developed it out of the chalumeau or shawm, a wind instrument of the oboe type but of a primitive kind—the word chalumeau is still used to define the lowest part of the compass of the C. The C. consists essentially of a mouthpiece furnished with a single beating reed—i.e. a reed which vibrates against an air-slot in the mouthpiece—a cylindrical tube ending in a bell, and provided with eighteen openings in the side, half of which are closed by the fingers and half by the keys. The reed is made from a thin slip of a Sp. reed (*Arundo sativa*) and is kept in place on a flattened table by means of a liga-



CLARINET

ture. Since the reed at one end of the tube serves to close it at that end, the pipe acts as a 'stopped' one, sounding an octave lower than an open one, which explains why the pitch of the C. differs from that of the flute. In orchestral music two instruments are employed, namely A pitch and B \flat —the C pitch instrument, to be observed in the scores of 'classical' composers, is now obsolete. In military bands, the Cs used are B \flat and E \flat . The C. was a common instrument in the church orchestras of this country in the late eighteenth and early

nineteenth centuries. Some notable orchestras evidently did not use Cs. until towards the close of the eighteenth century, e.g. the Viennese court orchestra, and it is to Mozart's fondness for the instrument that is owed the earliest notably artistic treatment of it. His symphony in E \flat major exemplifies his love of the instrument. Weber also showed great fondness for the C. and after that time two Cs. of the normal size became a *sine qua non* of every orchestra. Other great exponents of the C. are Brahms, Beethoven, Mendelssohn, Spohr, and Schubert. There are various other instruments of the C. family: high E \flat , which is pitched a perfect fourth above the B \flat instrument; the alto C. in E \flat and F, a military band instrument now superseded by the saxophone; and the basset horn. This latter, which in appearance is like the bass C., is in fact a tenor instrument, its pitch being an octave lower than that of the obsolete C. of C pitch.

Clarion: 1. A shrill-sounding trumpet, not now in use, formerly employed as a signal to arms. 2. An organ stop, having pipes with reeds, which give a piercing sound like that of a C. 3. A bearing much in use in early Eng. heraldry.

Clark, Charles Heber, see ADELER, MAX.
Clark, Edwin Charles (1835-1917), Eng. barrister, was b. near Shrewsbury, and graduated at Trinity College, Cambridge, of which he became fellow. Subsequently he was appointed regius prof. of civil law at Cambridge. Author of *Early Roman Law: Regal Period* (1872), *An Analysis of Criminal Liability* (1880), *Practical Jurisprudence* (1883), *Cambridge Legal Studies* (1888), *History of Roman Private Law*, vol. i. (1906).

Clark, Francois Edward (1851-1927), Amer. clergyman (originally surnamed Symmes), b. at Aylmer in Quebec, Canada. He became pastor of a Congregational church at Portland, Maine, in 1876, where he founded (1881) the Young People's Society of Christian Endeavour. He was editor (later honorary editor) of the *Christian Endeavour World* from 1886 until his death, and president of the United Society (1887-1909). He travelled round the world five times, and wrote many books, including *Our Journey around the World* (1901) and *World-wide Christian Endeavour* (1906). See also CHRISTIAN ENDEAVOUR.

Clark, George Rogers (1752-1818), Amer. frontier general, b. in Albemarle co., Virginia; educated at a common school. Explored the region W. of the Alleghanies in 1772; practised as a surveyor; engaged in many encounters with the Indians on the Ohio R. in 'Dunmore's war'. Removed to Kentucky (then a mere dist.) in 1776 and became one of its delegates to the Virginia legislature. In the war of Independence he defeated Lt.-Governor Henry Hamilton, 1779, at Fort Sackville; for this and similar services C. received a grant of land from the U.S. Gov. He took part in the Fr. operations against Spain in the Mississippi valley. He d. in poverty near Louisville, Kentucky.

Clark, John Bates (1847-1938), Amer. economist, *b.* at Providence, Rhode Is. He studied at the univs. of Heidelberg and Zürich, and was appointed prof. of political economy and hist. at Columbia Univ. in 1895. Works: *The Philosophy of Wealth* (1885); *Capital and its Earnings* (1888); *Wages* (1889); *The Control of Trusts* (1901); *The Distribution of Wealth* (1901); *The Problem of Monopoly* (1904); *Essentials of Economic Theory* (1907); *The Modern Distributive Process*, with F. H. Giddings, 1909; *Control of Trusts*, enlarged ed., with J. M. Clark (1912).

Clark, Josiah Latimer (1822-98), Eng. electrician and engineer, *b.* at Great Marlow, Buckinghamshire. He took a junior position on the construction of the Britannia tubular bridge, after which he became assistant engineer to the Electric Telegraph Company, with whom he remained till 1870. He worked out the system of enclosing underground wires by means of gutta-percha coating, of sending messages by the pneumatic tube, and invented the double-cap invert insulator and the C. cell. He also made investigations with regard to submarine cables and invented C.'s compound, a mixture of asphalt, hemp, and silica, with which such cables are now covered. The practice now in use of stamping telegrams and of registering abbreviations for cablegrams originated from a suggestion by C. He pub. sev. works, including *Electrical Tables and Formulæ* (1871), and a *Dictionary of Metric and Other Useful Measures* (1891).

Clark, William Tierney (1783-1852), Eng. civil engineer, *b.* in Bristol. He became chief engineer to the W. Middlesex Waterworks, and constructed the Thames and Medway Canal, the Hammersmith suspension bridge (1824-27), and the suspension bridge over the Danube at Budapest (1839-49).

Clarke, Adam (1762-1832), Wesleyan Methodist preacher, *b.* co. Londonderry. He brought out a *Bibliographical Dictionary* (1802-6) in eight vols., but his chief work was a *Commentary on the Bible* (8 vols.) (1810-26). He also wrote *Memoirs of the Wesley Family* (1823). His biography, entitled *Account of the Infancy, Religious and Literary Life of Adam Clarke* (1833), is in 3 vols., the first being autobiographical (religious life) and the other two by his daughter. Consult also the life written by Etheridge, 1858.

Clarke, Charles Cowden (1787-1877), Eng. author, and an intimate friend of the Shelley group. His lectures on Shakespeare, delivered in London during the years 1834-54, made him famous. His wife Mary, daughter of V. Novello, musician, compiled a complete *Concordance to Shakespeare* (1844-45). Joint productions of the husband and wife included an annotated ed. of Shakespeare (1869); *The Shakespeare Key, unlocking the Treasures of his Style* (1879); and *Recollections of Writers* (1873). Charles Cowden C. also pub. *Tales from Chaucer in Prose* (1833); and *Shakespeare Characters, chiefly those Subordinate* (1863). See M. V. C.

Clarke, Centennial Biographic Sketch of Charles Cowden Clarke, 1887; and R. D. Attkin, *The Cowden Clarks*, 1949.

Clarke, Edward Daniel (1769-1822), Eng. traveller and mineralogist, *b.* at Willington, Sussex. After having graduated at Cambridge (1790), he accompanied Cripps on a tour through Europe, Egypt, and Asia Minor (1799-1802), from which he brought back the colossal statue of the Eleusian Ceres, now in the Fitzwilliam Museum. He was appointed prof. of mineralogy at Cambridge in 1808. He pub. his *Travels in Various Countries of Europe, Asia, Africa* (1810-23); *Greek Marbles brought from the Shores of the Euxine Archipelago and Mediterranean* (1809). See W. Otter, *Edward Daniel Clarke: Life and Remains*, 1925.

Clarke, Sir Edward George (1811-1931), Eng. barrister, eldest son of J. G. C., a London Jeweller. Educated at College House, Edmonton; City Commercial School; City of London College; King's College evening classes. He was a writer in the India Office, 1859-60, and Tancered law student, 1861, and was called to the Bar three years later. He sat in Parliament, representing Southwark (1880), Plymouth (1880-1900), and City of London (Jan.-June 1906). In 1886, during Lord Salisbury's ministry, was appointed solicitor-general and knighted. The chief cases that he was connected with in his legal career were the Pengo case (1877), the Bartlett case (1886), the Baccarat case (1891), and the Jameson case (1896). He disagreed with his party over S. Africa in 1899, and over Tariff Reform in 1903. He was made a Privy Councillor in 1908, and retired from the Bar, 1914. *D.* suddenly April 26, 1931. His pub. include a *Treatise on the Law of Extradition* (1866) (4th ed. 1903); *Public Speeches* (1888-90 and 1890-1900); *Selected Speeches* (1908); *Easy Shorthand* (1907); *The Story of my Life* (1918); *Benjamin Disraeli, the Romance of a Great Career* (1926).

Clarke, Sir George Sydenham, see SYDENHAM OF COMBE, LORD.

Clarke, James Freeman (1810-88), Amer. Unitarian minister, *b.* in Hanover, New Hampshire, U.S.A. He graduated at Harvard, 1829, and at the Cambridge Divinity School, 1833. He took part in the founding of the Unitarian Church of Disciples in Boston (1841), to which he acted as pastor (1841-50 and 1853-88). He was appointed prof. of natural religion and Christian doctrine (1867-71) and lecturer on ethnic religions (1867-77) in Harvard Univ. C. was a keen advocate of the anti-slavery cause, and a voluminous writer. His works include *Campaign of 1812* (1848); *Eleven Weeks in Europe* (1852); *The Christian Doctrine of Forgiveness of Sin* (1862); *Orthodoxy* (1866); *Steps of Belief* (1870); *Ten Great Religions* (1871-83); *Self-Culture* (1882); *The Ideas of the Apostle Paul translated into their Modern Equivalents* (1884); *Manual of Unitarian Belief* (1884); *Anti-Slavery Days* (1884); and *Vexed Questions* (1886). See his *Autobiography, Diary, and Correspondence*, ed. by E. E. Hale, 1891.

Clarke, Marcus Andrew Hislop (1846-1881), Australian writer, *b.* at Kensington, London. He emigrated to Victoria at the age of eighteen, and entered upon a journalistic career, writing under the pseudonym *Peripatetic Philosopher*. His best work is a novel on the cruelties of the life in a prison settlement, *For the Term of his Natural Life*, pub. in 1874. Among his other works are *Long Odds* (1869); *Holiday Peak* (1873); and *History of the Continent of Australia, 1787-1870* (1877).

Clarke, Mary Victoria Cowden (1809-98), wife of Charles Cowden C., was a pupil and a friend of Mary Lamb. In addition to the works written with her husband, she pub. *The Complete Concordance to Shakespeare* (1844-45); *The Girlhood of Shakespeare's Heroines* (1850); *The Iron Cousin* (1854); *World-noted Women* (1858); a biography of her husband (1887); and *My Long Life* (1896).

Clarke, Samuel (1675-1729), Eng. divine and philosopher, *b.* in Norwich. He could not agree with the theories of Descartes in vogue at the time, and accordingly became a follower of his friend Newton. In 1706 Queen Anne chose him as her chaplain, and in 1709 appointed him to the rectory of St. James, Westminster. His treatise *The Scripture Doctrine of the Trinity* (1712) in which he stated that the doctrine of the Trinity was not held by the early Church, was considered semi-Arian, and C. was brought before Convocation. His famous discussion with Leibnitz as to the relation of time and space to God was undertaken by request of the Princess of Wales, and the papers were pub. in 1717. C. delivered the Boyle lectures in 1704-5, choosing for his subject *The Being and Attributes of God*. C. won a very high reputation as a philosopher and in the sphere of metaphysics was regarded as second only to Locke. Other essays of his to be noted are *A Discourse concerning the Unalterable Obligations of Natural Religion* (1708); and a *Philosophical Inquiry concerning Human Liberty* (1715). Consult his life by B. Hoadly, prefixed to the collected ed. of his works, 1738-42; and the *Historical Memoirs* by W. Whiston, 1730; also Sir Leslie Stephen, *History of English Thought in the Eighteenth Century*, 1876.

Clarke, William Branwhite (1798-1878), Eng. geologist, *b.* at E. Bergholt, Suffolk. In 1840 he went out to Australia and became vicar of a church in Willoughby, New S. Wales, 1847-70. C. had previously made many geological investigations of the Continent of Europe. He discovered gold in Australia in 1841, tin in 1849, and diamonds in 1859. He carried on valuable investigations, and obtained the Murchison medal from the Royal Geographical Society in 1877. He wrote *Remarks on the Sedimentary Formations of New South Wales* (1878), and many other scientific papers.

Clarksburg, city in W. Virginia, heart of bituminous coal region, natural gas, factory for making toy marbles, glass factories. Pop. 30,500.

Clarkson, Thomas (1760-1846), Eng.

anti-slavery agitator, *b.* in Wisbech, Cambridgeshire. In 1785 he won a prize for his Lat. essay, *Anne liceat invitato in servitutem dare?* of which his Eng. trans. (1786) had a very large sale. From this time he worked with ceaseless energy to bring about the abolition of African slavery by speaking in the chief towns of England and in Paris, and by issuing numerous pamphlets on the subject. In 1807 the Bill for the abolition of the slave trade became law, on which occasion Wordsworth wrote his sonnet, *Clarkson, it was an obstinate hill to climb*, and in 1808 C. himself pub. *The History of the Rise, Progress, and Accomplishment of the Abolition of the African Slave Trade*. He was active in founding an Anti-Slavery Society (1823), the object of which—to suppress slavery in the W. Indies—was accomplished by the passing of the Emancipation Bill in 1833. In his latter years he founded institutions for sailors at seaports, and did much philanthropical work. His essays include *On the Slavery and Commerce of the Human Species* (his trans. of the Lat. essay mentioned above, 1785) and *The Cries of Africa to the Inhabitants of Europe* (1822). He also wrote *Memoirs of the Private and Public Life of William Penn* (1813). See T. Taylor, *Biographical Sketch of Thomas Clarkson*, 1839; T. Elmes, *Life of Thomas Clarkson*, 1876; and E. L. Griggs, *Thomas Clarkson, the Friend of Slaves*, 1936. See also CLAPHAM SECT.

Clarksville, city in Tennessee, U.S.A., cap. of Montgomery co., 10 m. N.W. of Nashville, is a railway centre and has an important trade in tobacco and a snuff factory. Pop. 11,800, of whom 41 per cent are negroes.

Clarus Mons, see under CLERMONT-FERRAND.

Classical Association, The, founded in London, Dec. 1903, partly an outcome of the numerous controversies over classical education and in particular over compulsory Gk. at the univs., which started as early as 1867 in *Essays on a Liberal Education*. The association aims at promoting the development and well-being of classical studies by every possible means, including free discussion of methods and friendly intercourse between all interested in the subject. It took up the reformed Lat. pronunciation (first proposed 1871) in 1904-5. The headquarters of the association are at Westfield College, Univ. of London, N.W.3. The chief publications are *Proceedings of the Classical Association*, and *The Year's Work in Classical Studies*.

Classion, *The* (through Fr. *classique* from Lat. *classicus*). The word *classic* was first used in its present sense by Gellius, who contrasts a *classicus scriptor* with one who is *proletarius*. The Rom. people were divided by Servius Tullius into five classes, the lowest class being called *proletarius*. The adjective *classicus*, from *classis*, literally belonging to a class, by transference meant belonging to the first or highest class. A *classic* writer is, therefore, one who belongs to the first class. A book is also called a *classic* if it

is of such a standard that it may be placed among the highest class of books. It is thus defined by Lowell, in *Among my Books*: 'A classic is properly a book which maintains itself by virtue of that happy coalescence of matter and style.' Thus every country is said to have a classical period in its literature—that is, a particularly fertile period when there is a great output of books in which imagination, thought, and style are perfectly blended. The so-called classical period of Eng. literature, however, is not her most flourishing period, but the period of Dryden and Pope, when it was the fashion of the day to adhere strictly to the rules and models laid down by the writers of anct. Greece and Rome. For, as Gk. and Rom. literature had long been regarded as affording perfect examples in every form of writing, the word classic was applied in particular to works of Gk. and Rom. authors. The term the C. is, therefore, applied to Gk. and Rom. literature, and is often applied to the languages themselves. Thus, the phrase 'the study of the classics' does not merely mean the study of anct. classical literature, but includes the study of the grammar and construction of the Gk. and Lat. languages. Modern classical scholarship begins with the Renaissance, although much work on Gk. literature had already been done by the scholars of Alexandria, who in the third century A.C. classified the texts that were then extant. After the Renaissance scholarship was naturally intent on going over the newly discovered treasures of classical literature. The printing of the C. in Italy in the sixteenth century—which was an event in itself—made classical study an integral part of the humanistic education, advocated by such a man as Erasmus. The founder of historical criticism was the younger Scalliger (1540–1609), who was also an adept at textual emendation, and his methods were inherited by the two great Eng. scholars of the eighteenth century, Bentley and Porson. In the nineteenth century scholarship in the hands of the Ger. scholars was mostly devoted to the editing and collating of the classical texts, while in England the Porsonian tradition passed from Cambridge to Oxford in the person of Elmsley (1773–1825). In Victorian England scholarship was marked by Jebb's ed. of Sophocles and Munro's ed. of Lucretius, Jowett's translation of Plato, Thirlwall's and Grote's History and Liddell and Scott's Lexicon. In the U.S.A. during the nineteenth century classical studies became of increasing importance, represented at Harvard by the Lat. scholar Lane, and at Yale by the Gk. scholar Seymour. An Amer. school was founded at Athens in 1881 and a Brit. school two years later. Since then archaeology has been a stimulus to modern scholarship, which in recent years has been actively fostered by societies both in England and America, and this in spite of the fact that the value of a classical education has been called in question. The most monumental work of any single Amer. scholar

is the *Lexicon Plautinum*, recently completed by G. Lodge. The Loeb Library of classical authors, text and trans. was initiated in the U.S.A., and additions are made to it each year. The twentieth century saw the beginning of the popularisation of the C. in cheap eds., of which Everyman's Library (q.v.) is the most comprehensive.

Classification (Lat. *classis*, a class), name given to the process whereby a number of objects which are alike in one or more respects are collected under a common name. Systematic C. is essential to any science; artificial C. is the name given to a collection of facts for some special purpose, such as statistics of various kinds. Each science has its own system of C., but the problem which has engaged the minds of scientists and philosophers from very early times is that of the relation of sciences to each other—that is, the C. of sciences as a whole. Of the many attempts made in this direction, those of Bacon, Comte, and Spencer may be briefly outlined as being representative of various views. Bacon's C. was based on a subjective criterion of the various faculties which are concerned in the study of different sciences. Hist. is, according to this theory, the science of memory, philosophy that of reason, etc. Comte's C. was based on an objective criterion; all sciences pass through three stages, according to him—theological, metaphysical, and positive. Of the positive sciences mathematics is the lowest, sociology the highest. Spencer classified sciences under three heads, as abstract, such as logic, etc.; abstract concrete, such as physics, mechanics, etc.; and as concrete, such as astronomy, sociology, etc. It is obvious that no system of C. can be regarded as perfect, as a preconceived theory inspired them. For different systems of C. see, in addition to the writers named above, Aristotle, Plato, Hobbes, Bentham, Wundt, etc.

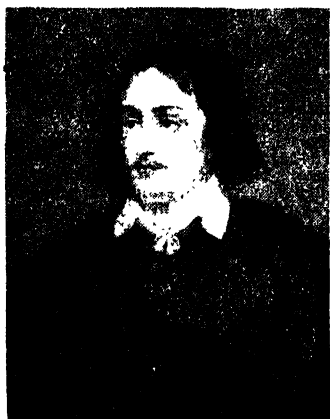
Classification, Library, see CATALOGUES AND CATALOGUING.

Clathropteris, genus of fossil ferns, founded by Brongniart. The typical specimen, *C. meniscoides*, occurs in the mesozoic sandstone of Hor in Scania.

Claude, Jean (1619–87), Fr. Protestant preacher and controversialist, was pastor at Charenton (1666–85), but, on the revocation of the Edict of Nantes by Louis XIV., was obliged to seek refuge in Holland. His works include *Défense de la réformation* (4 vols.) (1671); *Réponse à la conférence de Bossuet* (1681).

Claude de Lorraine (1600–82), properly called **Claude Gellée**, Fr. landscape painter, b. at Chamaigne, in Lorraine. Being left an orphan at the age of twelve, he went to live with an elder brother, a wood-carver at Freiburg, and when still a boy travelled in Italy. At Rome he received employment in artists' studios, and was fortunate in coming under the notice of Agostino Tassi, the landscape painter, who gave him lessons. He may also have studied under Godfrey Waals at Naples, and finally settled in Rome in 1627. Not long after he attracted the attention

of Cardinal Bentivoglio, who procured him an introduction to Pope Urban VIII., and a commission for two paintings: 'La Fête Villageoise,' and 'Un Port de mer au soleil couchant,' now in the Louvre. C.'s pictures commanded high prices even during his lifetime (Clement IX. offered for 'Villa Madama' as many pieces of gold as could cover the canvas), and he was troubled with many forgers. Accordingly, he kept sketches of his pictures in paper books, which he called his *Libri di Verità*. Those were afterwards engraved by Karlom; the originals belong to the duke of Devonshire. C. excelled as a landscape painter. His colouring is



CLAUDE OF LORRAINE
Engraving after a painting in the Musée
Royale, Paris.

very delicate and harmonious, and perhaps no other painter has had a more perfect knowledge of the lights and shades of the sky, changing continually from dawn till night. He was not successful in figure-drawing, in which he sometimes received help from fellow artists, and is supposed to have once said that he sold the landscape and gave away the figures free. His landscapes number about 400, and are to be found in all the chief galleries of Europe. Consult Ruskin, *Modern Painters*, 1843-60; Mrs. Mark Pattison, *Claude Lorrain, sa vie et ses œuvres*, 1884; A. M. Hind, *The Drawings of Claude Lorrain*, 1925; and P. Courthion, *Claude Gellée, dit le Lorrain*, 1932.

Claudel, Paul Louis Charles, b. at Villeneuve-sur-Fère, France, Aug. 6, 1868. is at once a distinguished diplomat and one of the best-known poets of his country. Has filled many consular posts, and has been Fr. ambas. to Japan, to the U.S.A. (1927-33), and to Belgium (1933-35). But he is chiefly known to fame as one of the greatest Catholic writers of France. His literary ancestors, so to speak, are the

Bible, Shakespeare, Æschylus, and Rimbaud. His dramas take place in time rather than in space. There is always a religious basis, the drama being one of the salvation or destruction of the soul. His prin. dramas are *Télé d'or* (1889); *L'Annonce faite à Marie*, originally written as *La Jeune Fille Violaine* (1910); *L'Otage* (1918); *Le Soulier de satin* (1929). His prin. poetic works are *Cinq Grandes Odes* (1911); *Corona benignitatis anni Dei* (1915); *Poèmes de guerre* (1922). Other pubs.: *Feuilles de saints* (1925); *Les Euménides d'Eschylus* (1920); *Conservation dans le Loir-et-Cher* (1937). A synthetic and obscure writer, who has adopted a form of verse recalling that of the Psalms and sometimes that of Walt Whitman. C.'s place in the literary firmament is both eminent and questioned. Some derive a novel aesthetic and spiritual experience from his drama and, to a less degree, from his verse, while others are unmoved by the shrill clarion call of his poetry. Those who, like M. Denis Saurat, deem C. inflated and meretricious, are perhaps justified in distinguishing between the sincerity of the work which is the outcome of his experience and the hollow rhetoric of the work which is merely founded on his opinions. Yet no other modern verse is at once so cosmic and yet personal, for it is the fruit of C.'s preoccupation with his own spiritual salvation, written without much regard for the contemporary world. His metrical ingenuity is marked and, like T. S. Eliot, he is skilful in the use of long unrhymed periods. C.'s plays are by no means easily adaptable to ordinary stage requirements and might seem rather to envisage a stage which exists only in the fancy. Thus *Le Soulier de satin*, divided into 'four days,' might well take as long to perform, but like Mr. Shaw's *Back to Methuselah*, it is none the less fine drama. An acting early version of this play was made by C. and performed with great success at the Comédie Française in 1944. More recently C. rewrote parts of *L'Annonce faite à Marie* for production in Paris. A less known play is *Partage de Midi*, written in the Far E. in 1906, only a few copies being printed. Yet it is regarded by the critics as one of his greatest works and, being an early work, throws light on the spiritual conflict out of which evolved the massive serenity of his matured religious commentaries.

Claudianus, Claudius (Claudian) (b. A.D. 365). Lat. poet, b. at Alexandria in Egypt. His native tongue was Gk., but he acquired a perfect command over Lat. In 395 he gained the favour of Stilicho, whom he eulogised in his *De Laudibus Stilichonis* (three books). His other writings are *Raptus Proserpine*, an epic poem; *Gigantomachia*, a fragment; *De Bello Gildonico*, and sev. occasional poems and panegyrics. After the war with Gildo, he was honoured by the Senate with a bronze statue in the forum of Trajan. His poems are vivid and written in a somewhat ornamental style. The best eds. are those of T. Birt (1892), J. Koch (1896), and M. Platmaier (with trans.

1922). See T. Hodgkin, *Claudian: the Last of the Roman Poets*, 1875; and J. W. Mackail, *Latin Literature*, 1895.

Claudius I. (10 B.C.-A.D. 54), Rom. emperor, whose full name was Tiberius Claudius Drusus Nero Germanicus. He was the son of Drusus Nero, brother of the Emperor Tiberius and Antonia, and was b. at Lugdunum (Lyons) in 10 B.C. He was sickly and neglected as a child, and did not come into prominence until in 41, after the assassination of Caligula, he was proclaimed emperor by the troops. C. embellished Rome by building an aqueduct and a harbour. In 43 he occupied Britain, to which he had previously sent two of his generals, Plantius and Vespasianus. In later life C. was ruled by his profligate wife, Messalina, who was executed for treason in 48. Two years later he married his niece, Agrippina, who prevailed on C. to adopt her son, Domitius, who assumed his stepfather's name of Nero. It is generally supposed that C.'s death by poisoning was at her instigation. (Tacitus, *Annals*, xi. and xii.)

Claudius II. (Marcus Aurelius Claudius), surnamed Gothicus (A.D. 268-70), Rom. emperor. He was b. in Illyricum of a family of no note, but distinguished himself in military service and was made governor of his native prov. under Valerian. On the death of Gallienus, the army proclaimed C. emperor. He defeated the Alemanni in the N. of Italy (268); and won a great victory over the Goths near Naissus, in Dardania, on which occasion he received his surname Gothicus. He d. at Sirmium in Pannonia.

Claudius Albinus, see **CLODIUS**.

Claudius, Appius Claudius Cæcus (fl. 320 B.C.), Rom. censor. He was elected to the censorship in 312, without having previously held the position of consul, and retained it for four years, though according to Rom. law no man might be censor for longer than eighteen months. He became blind, hence his name *Cæcus*. He built the Applan aqueduct, which brought water to Rome from Tusculum, and began the construction of the Via Appia. In the war with Pyrrhus, the terms of peace, drawn up by Cincæus, were rejected by the Senate largely because of Appius's spirited opposition to them.

Claudius, Appius Claudius Sabinus Regillensis (fl. 500 B.C.), Sabine of the tn. of Regillum, where he was known as Attus Claudius. In the war between the Romans and Sabines in 504 B.C. he advocated peace. He settled in Rome, where he was adopted into the patrician rank. He became consul in 495, and the enmity he displayed towards the plebeians led to their secession to the Mons Sacer in the following year. The Sabines who accompanied him to Rome were given lands by the Aulo, and were known as the tribe of Claudians.

Claudius, Publius Claudius Pulcher, generally known as Clodius (d. 52 B.C.), was descended from an illustrious family, and was notorious for his licentiousness. In 62 he entered the house of Julius Cæsar and profaned the mysteries of the Bona Dea, which were being celebrated

by Pompæa, Cæsar's wife, and other Rom. matrons. Clodius was brought to trial in the following year, but by corrupting the judges he obtained an acquittal. Cicero had given evidence at the trial, for which Clodius never forgave him. He descended from patrician rank, and was adopted into a plebeian family that he might become a tribune of the plebs. He was chosen tribune in 58, and used his influence to banish Cicero from Rome on the grounds that the latter had unlawfully punished the adherents of Catiline with death. In spite of Clodius, however, Cicero was recalled in the following year. In 56 Clodius became ædile, three years stood as a candidate for the pretorship, and was murdered in Jan. 52, on the Appian road, by the supporters of his enemy Milo.

Claus, Emile (1849-1924), Flemish painter, popular for his studies of children. Examples of his works are in the galleries of many of the chief tns. of Europe.

Claus, Santa, see **CHRISTMAS**.

Claudel or **Claudel, Bertrand Count** (1772-1842), Fr. soldier and marshal of France. He distinguished himself with the army in Naples, Dalmatia, and Portugal. In 1813 he was almost daily engaged with the Eng. during the retreat of the Fr. before Wellington, into France. He was exiled in 1815, after he had opposed the troops of the duchess of Angoulême during the Hundred Days, but returned in 1820. He was made a marshal by Louis Philippe and governor of Algeria. He was commander-in-chief of the African army until the check sustained before Constantine caused his recall in 1836.

Clausen, Sir George (1852-1944), Eng. painter, son of a decorative artist of Dan. extraction, was b. in London. Went to the National Art School (now Royal College of Art). Studied under Bouguereau and Robert Fleury, with whom, however, his work has nothing in common. He was, however, permanently influenced by Millet, Corot, and Manet, as was evident in the paintings which he exhibited at Burlington House in the seventies, pictures of country life and landscape full of life and movement. His best paintings were always the fruit of a deep study of country life—of landscape in sun and shade, of flowers, of work on the farm. His picture 'The Girl at the Gate' was bought by the trustees of the Chantrey Bequest for the nation and may be seen in the Tate Gallery. Nobody excelled him in the power of suggesting bulk and solidity in conditions when the actual features of the landscape were almost obliterated, and his pictures also render excellently the appearance of things in brilliant sunshine or under shelter. Of his landscapes in this kind 'The Gleaners Returning' in the Academy of 1908 was also bought by the Chantrey Bequest. Barn interiors, paintings of the nude, and still-life compositions were other characteristic subjects. His portraits include that of himself at the Fitzwilliam Museum, Cambridge, in water colours. A.R.A., in 1895; R.A. in 1908; knighted in 1927.

Clausewitz, Karl von (1780-1831), celebrated Prussian general and writer on theory and tactics of warfare at Burg. He served with Prussia from 1792—being engaged in the campaigns of the Rhine, 1793-94, and attending the Berlin school for young officers 1801-3, where he won the favour of Scharnhorst. In the campaign of 1806 he attended Prince Augustus as adjutant, was taken prisoner with him at the capitulation of Prenzlau. After his exchange, he was major on the general staff till 1812. In that year he entered the Russian service, in which he remained till 1814, having been Russian staff officer with Blücher's campaign of 1813. He returned into Prussian service. In all his campaigns he distinguished himself by his intelligence and resource. He was made chief of a Prussian army corps in 1815, and in 1818 was made major-general and a director of army schools and an inspector of artillery. It is, however, from his writings on the theory of warfare that he is most famous. His best-known work, his great book on war in three vols., entitled *Vom Kriege* (1832), was an epoch-making work in regard to the subjects of which it treats. He also wrote *Der Feldzug von 1796 in Italien*; *Der Feldzug von 1813* (1813); and *Über das Leben und den Charakter von Scharnhorst* (1832). Much capital was made out of his military theories during the First World War by the Allies' propagandists. He d. at Breslau of cholera.

Clausius, Rudolf Julius Emmanuel (1822-88), Ger. physicist, of Köslin, Pomerania. He taught for twelve years at the Federal Polytechnikum at Zurich. Thermodynamics was the science to which he gave special study and, in a lesser degree, optics and electricity. He earned the credit of being the founder of thermodynamics as a science; and, by his restatement of Carnot's principle (see THERMODYNAMICS) he put the theory of heat on a sounder basis. He was the developer of the kinetic theory of gases (1857), on which aspect of the theory of gases Joule (q.v.), and THERMODYNAMICS) had six years before advanced the same hypothesis, based on his own studies in the mechanical equivalent of heat. C. calculated the average velocities of the molecules and the average distance through which they move in a straight line between collisions. He was awarded the Copley medal of the Royal Society in 1879. Among his numerous works may be mentioned *On the Nature of Heat, compared to Light and Sound* (1857); *Mechanical Theory of Heat* (1864-67).

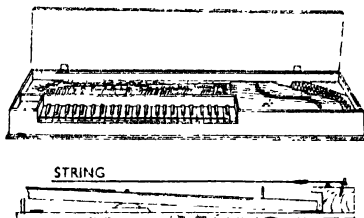
Claustal-Zellerfeld, tn. of Hanover, Germany, among the Harz Mts., 25 m. N.E. of Göttingen. The centre of an important mining dist. for silver, lead, and other metals. Pop. 11,300.

Clavagella, or Club-shell, lamellibranch typical of the family Clavagellidae, to which belongs also the well-known mollusc *Aspergillum*. They usually live in corals and rocks.

Claverhouse, see DUNDEE, VISCOUNT.

Clavichord or Clavichord musical

instrument which preceded the pianoforte. The strings were struck by brass tangents projecting from the ends of the keys, instead of by hammers. It is of the same type as the harpsichord and spinet, but these are plucked to set the strings in vibration.



CLAVICHORD

Above is the typical clavichord; and below, a theoretical diagram of the action on a larger scale.

Clavicle (from Lat. *clavis*, key), bone commonly known as the collar-bone. It is connected at its inner end with the sternum or breastbone, and at its outer or scapular end with the shoulder-blade, together with which it forms the arm-socket. In animals it is shorter than in man, where it is a long bone shaped like an S and lying nearly horizontal. The bone is easily fractured or dislocated, but can be fairly easily returned to its place and pieced together when the arm is supported. The merry-thought of a fowl is composed of the two Cs.

Clavicornes (Lat. *clava*, club, *cornu*, horn), name given by Latreille to those coleopterous insects in the section Pentameria which have their antennae thickened at the apex and thus resemble a club in shape. Burying-beetles and bacon-beetles belong to the group.

Clavie, Burning the. This is an ant. Scottish custom, which was once more widely distributed, but is now only kept up at Burghhead, a small fishing vil. on the Moray Firth. The custom takes its name from the Lat. word *clavis*, a nail, as a bonfire is first made of split casks, one of which is then joined together again by large nails. The cask is then filled with tar, ignited, and carried round the vil. up to a headland where there are the remains of a Rom. altar; the assembled people scramble to get a piece of the C. with which to light their New Year's fire, and the charcoal of the C. is put up the chimneys, as it is supposed to prevent witches and evil spirits from descending. The date of this old custom is Jan. 12, the old New Year's Day.

Clavijero, Francisco Xavier (c. 1720-1787), Sp.-Mexican historian, b. at Vera Cruz, Mexico. Pub. in It. *Storia Antica del Messico* (Cesena, 4 vols., 1780-81). It was trans. into Eng. by Cullen in 1787. C. also wrote *Storia della California* (Venice, 1789).

Clavijo y Fajardo, Don José (1730-1806), Sp. publicist and naturalist, b. in the Canaries. He was challenged to a duel by Beaumarchais, whose sister he had jilted. He trans. Buffon's *Histoire Naturelle* in 1785-90, for which he was rewarded by being appointed director of the Natural Hist. Museum in Madrid. Goethe drew largely on C.'s story for his *Clavijo*, 1774.

Clavius, Christopher (1537-1612), Ger. Jesuit priest and mathematician, who was employed by Pope Gregory XIII. to superintend the reformation of the calendar. He had a very high reputation as a mathematical writer, and has even been called 'the Euclid of the sixteenth century,' but he had little original genius, and in consequence his works are not now held in such high esteem as formerly.

Claws, term applied in zoology to various sharp appendages on the limbs of different animals, and frequently they are not homologous. The sharp nails of a vertebrate, the chelipeds of a lobster, and the chelicere of a scorpion are all termed C. In vertebrates they are formed of hardened and thickened epidermal tissue, and in the cat they are retractile, i.e. they can be drawn in and thrust out at will.

Clay, name applied indefinitely to the finer waste matter arising from the decomposition of rocks. C. is distinguished by its ductility and tenacity, and consists mainly of alumina and silica with a small quantity of water. It is rarely found in a pure state except where rocks containing felspar have decomposed, and is used chiefly in the manuf. of bricks.

Clay, Alfred Borron (1831-68), Eng. painter. Received tuition in art from his father. He was articled to a solicitor, but gave up the law to study art. He attended the Royal Academy School. Among his works may be mentioned 'The Return to Whitehall, May 29, 1660' (1867), now at Liverpool; 'Imprisonment of Mary Queen of Scots at Lochleven Castle' (1861).

Clay, Cassius Marcellus (1810-1903), Amer. politician, b. in Madison co. in Kentucky, and educated at Central College, Danville, and at Yale Univ. He was passionately opposed to slavery, and spent much of his energies opposing it; as a result of his sympathies he was forced to fight many duels and made many enemies. He was U.S. minister to Russia 1861-69. In 1872 he was one of the organisers of the Liberal Republican revolt, and took a prominent part in politics until he retired.

Clay, Frederic (1838-89), Eng. musical composer, was the son of James C., the famous authority on whist. He studied music at Paris under W. B. Molique, and under Hauptmann at Leipzig. His works include a number of light operas, but he is best known by his songs, *I'll sing thee songs of Araby* (from a cantata setting of Moore's *Lalla Rookh*), *She wandered down the mountain side*, and *The Sands of Dee*.

Clay, Henry (1777-1852), Amer. statesman and lawyer, b. in Virginia. Called to

the Bar at an early age, after an indifferent education, he quickly distinguished himself as an advocate. In 1803 he, to fill unexpired term, was elected member of the Kentucky legislature, in 1806 and 1810, of the state Senate, and in 1811 of Congress, becoming speaker of that body. His fiery speeches did much to bring about the war of 1812, and in 1814 he represented the U.S.A. at Ghent in the peace negotiations with Great Britain. He thrice unsuccessfully contested the presidency: first in 1824, when he stood against Adams, and again in 1832 against President Jackson, and 1844 against Polk. In 1825 Adams made him foreign secretary. After a period of retirement from politics he again entered the Senate (1831), and till his death retained all his old influence either there or as an adviser of the Whigs. In his foreign policy he warmly espoused the cause of the S. Amer. republics in their struggle for independence. His objective was that the U.S.A. should recognise the republics as such, and accordingly, after the rising in Spain in 1820, he moved in Congress an appropriation for sending ministers to these republics. His resolution was defeated, but he followed it up by another in 1821, expressing the sympathy of the people of the U.S.A. with the struggle of the republics to throw off the Sp. yoke. This was passed, but not until after the Sp. treaty of 1819 respecting the boundaries of the Floridas and Texas and other, had been ratified by Spain, when the resolution could hardly prejudice Amer. interests. His name will ever be stamped on Amer. economic hist. by reason of his part in the development of the Amer. system of protection to manufactured goods by tariffs, and the fostering of internal improvements by state grants or loans. C. came out as a protectionist during the nullification campaign of 1832-33 (see NULLIFICATION), when he astounded his followers by introducing a new Tariff Bill in which he proposed to reduce all existing duties to an *ad valorem* basis of 20 per cent, such duties as exceeded that rate to be gradually diminished over a period of ten years, when the rate should become uniform. The Bill, which was a mere compromise, was passed mainly to appease S. Carolina; but in his subsequent speeches it is clear C. was for a protectionist policy on general grounds of political expediency, viz. that the European nations had adopted the system, that it was necessary to create a home market for agriculture so as to keep pace with the rapid increase in Amer. power of production; and that a compact system of home manufs. made for union among the states. He advocated a convertible paper currency, demanded state assistance in the development of rail and water communications, and effected a compromise between the slave states and the Abolitionists (see on this COMPROMISE MEASURES, OF 1850). See C. Colton (ed.), *Works of Henry Clay*, 1863.

Clay Cross, urb. dist. of Derbyshire, England. The centre of a coal and iron

dist. of some magnitude, it is situated 5½ m. S.E. of Chesterfield. Pop. 9000.

Clay Ironstone, name given to the ore from which iron is smelted, in particular the carbonate (siderite) which occurs mixed with clay. In common with blackband ironstone, the ore is found chiefly in beds composed of small balls or nodules, and fossils are frequently met with embedded in the plastic substance. Before smelting, C. I. is usually subjected to roasting for a period of a month or so—the ore being broken up for this purpose—and during this time it loses from one-quarter to one-third of its weight. The method of smelting adopted is, in most cases, that of the blast furnace. Analysis has demonstrated that C. I. contains a large number of impurities, but the two chief constituents are ferrous oxide (about 40 per cent) and carbonic acid (about 25 per cent). The total metallic iron present averages 30 per cent. The condition in which this is present (ferric or ferrous) depends on the extent to which the processes of oxidation and hydration have been carried by the atmosphere. Ironstone in some form or other is found in practically all the coalfields of Great Britain, generally in convenient proximity to the limestone, which then forms its fuel. The earthy nature of the ore renders the addition of calcareous fuel necessary before it can be properly smelted, and the convenient distribution of ironstone and limestone referred to has formed a big factor in the industrial development of Great Britain.

Claymore (Gaelic *claidheamh mor*, great sword), two-edged broadsword of the auct. Scottish highlanders, celebrated in many a song and ballad. It is also the name inexactly given to the basket-hilted broadsword introduced in the sixteenth century, which was frequently single-edged. It was not usual for the C. to be wielded with both hands. Cs. are still carried by the officers of Scottish regiments in the Brit. Army.

Clay Soils derive their specific character from the hydrated silicate of alumina ($\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$) which is found in them, both in a state of mixture and in chemical combination. China C. or kaolin is a very pure form of this silicate. Although some soils are found to contain upwards of 30 per cent of this alumina, and hardly any soil is quite free from it, the amount rarely exceeds 2 per cent. When farmers speak of a clay soil, they mean an intractable earth, which, when dry, becomes baked as hard as a brick, and which in its wet state is so sticky as to resist all efforts to work it with ordinary agric. implements. A pure clay soil would be quite infertile, but its felspars are almost always composed partly of lime, potash, and soda, which render the soil amenable to cultivation. As they hold water, are cold, and fairly impervious to air, C. S. are unsuitable for building purposes.

Clays, Paul Jean (1819-1900). Belgian painter of the school of Willems and Leys. Among his best-known pictures are 'Calm in Zealand,' 'The Open North Sea,' 'A

Squall on the Scheldt,' and 'Dutch Boats in the Flushing Roads.'

Clayton urb. dist. in the W. Riding of Yorkshire, England, situated 3½ m. to the W. of Bradford. Pop. 5000.

Clayton, John Middleton (1796-1856), Amer. politician, was b. at Dagsborough, in Sussex co., Delaware. He was engaged in politics from a comparatively early age, and sat in U.S. Senate 1829-37, 1845-49, and again from 1851 till his death. His is chiefly known by his negotiation of the C.-Bulwer Treaty, when he was secretary of state in 1850. He d. at Dover in Delaware.

Clayton, Robert (1695-1758), Irish bishop, whose motion in 1756 in the Irish House of Lords, for the expunging of the Athanasian and Nicene Creeds from the liturgy, gave great offence, and the feeling against him was increased by his pub. of *A Vindication of the Old and New Testament* in 1757. C. was threatened with a legal prosecution, but d. before the proceedings opened.

Clayton-Bulwer Treaty, between Great Britain and the U.S.A., was so called from the names of the statesmen representing the respective countries. The U.S.A. were represented by J. M. Clayton, Great Britain by Sir Henry Bulwer. By the terms of the treaty both parties pledged themselves to respect the neutrality of the proposed ship canal across Central America. Between 1880 and 1884 the Gov. of the U.S.A. put forward sev. reasons why it might, when it thought fit, withdraw from its contract. These reasons, it may be stated, could not be reconciled with any system of law, national or international. The C.-B. T., which was concluded at Washington on April 19, and ratified on July 4, 1850, was abrogated in 1902 by the Hay-Pauncefote Treaty, which embraced the neutrality rule for the Panama Canal.

Clayton-le-Moors, par. and tn. of Lancashire, England, in the div. of Accrington, from which it is distant 1½ m. It is situated on the Leeds and Liverpool Canal, and coal-mining is carried on. Pop. 7300.

Clazomenæ (the modern *Kelesman*), auct. tn. of Ionia, and a member of the Ionian Confederation of Twelve Cities, or Dodecapolis. The inhab., alarmed by the Persian invasions, removed to one of the small is. of the bay from an isthmus which connected the mainland to a peninsula. Alexander the Great built a pier to the mainland, and the remains are still visible. It was the bp. of Anaxagoras, and is famous for the terra-cotta sarcophagi found there.

Cleanthes (c. 300-c. 220 B.C.), Stoic philosopher, the successor of Zeno of Citium, was b. at Assos, in the Troad. He attended the lectures of Zeno for nineteen years, and, in order to obtain money to pay his class fee, he used to draw water for the gardens about Athens and to grind corn in the night. On the death of his teacher, C. became the recognised head of the Stoic school, and was himself succeeded by his pupil, Chrysippus. He wrote many treatises, but the only work

of his that is extant is a beautiful *Hymn to Zeus*, written in Gk. hexameters. He d. of voluntary starvation.

Clearances, The, dispossession of the crofters of the Scottish highlands, dating from 1750, by landowners who introduced sheep-rearing. This led to a considerable emigration to N. America.

Clear, Cape, most southerly point of Ireland. It is the name given to the south-westerly extremity of Clear Is.; there is a lighthouse and telegraph station on the cape.

Clear Island, small is. in the co. of Cork, Eire, about 4 m. from the mainland, with an area of only 1504 ac. and a pop. of 565. The chief occupation of the inhab. is fishing.

Clearchus, Spartan general of the fifth century B.C. After commanding a portion of the fleet in the battle of Cyzicus, he was sent as harmost to Byzantium, but so infuriated the people by his despotism that the inhab. opened the gates to Alcibiades. He assisted the young Prince Cyrus against Artaxerxes. He received the command-in-chief of the Gks. after the battle of Cunaxa, and directed the retreat of the Ten Thousand, until he was led into an ambush by Tissaphernes, and delivered to Artaxerxes, who put him to death in 401 B.C. See also TEN THOUSAND, EXPEDITION OF THE.

Clearfield, co. seat of C. co., Pennsylvania, U.S.A. It is situated on the W. branch of the Susquehanna R., at a distance of 92 m. to the E.N.E. of Pittsburgh. Has foundries, and tanning, tile, and drain-pipe works. Pop. 9000.

Clearing-houses, institutions estab. by bankers for the adjustment of their mutual claims for cheques and bills, by exchanging them and settling the balances. The London bankers' C. was estab. by the prin. bankers in London in the year 1770. There are two clearings, the balance being struck only at the afternoon clearing. Clerks representing the different banks first go to the C. for the purpose of getting 'in' clearings entered (i.e. drafts against their banks); they then return to their offices so that the 'out-books' there may be cast and sent down to the C. to be checked against the 'in-books' of other banks. The London bankers' C. enables the claims of the member banks to be set off against each other, only the balance of account (e.g. cheques) being met by a transfer of funds at the bank of England. See also BANKS and BANKING.

Clearing Nut, seed of a tree (*Strychnos peltatum*) of the order Coganaceæ. The fruit is a single seed enveloped in pulp. The people of India use it for scouring the inside of their pots before filling them with water from rivs, or ponds, the impurities in the water sinking to the bottom as a result of the albumen and casein in the seed.

Clear-story, see CLERESTORY.

Clearwater, city on the W. coast of Florida, U.S.A. 30 m. W. of Tampa, a winter resort with orchards and market gardens and fisheries. Pop. 10,100.

Clear, nautical term for a double hook used for making ropes fast without tying

them by a knot. They are of different shapes, and are placed in various parts of a boat. A thumb C. is a small piece of wood affixed to a spar so that a rope can be bent around it. A comb C. resembles a small double-arched bridge.

Cleator Moor, urb. dist. and tn. situated on the It. Eden, 4½ m. S.E. of Whitehaven. There are extensive coal mines and furnaces for the manuf. of hæmatite iron, also engineering works and brass foundries. From the moor itself large quantities of very good iron ore are obtained. Pop. 8000.

Cleavage, property possessed by rocks and crystals by which the forces of cohesion submit to a wedging strain more readily in some directions than in others. A homogeneous mass is broken into irregular fragments, but crystals, the molecules of which have been deposited with a certain orderly arrangement, tend to split into smooth-faced fragments. The direction in which the splitting occurs is always parallel to a possible face of the crystal, and is called a C. plane. The property is independent of hardness, as the hardest of crystals, diamond, is easily cleavable, while minerals of intermediate hardness are sometimes cleavable with difficulty, e.g. quartz and garnet; again, gypsum, a soft mineral, has a good C. The most perfect of all Cs. is possessed by mica, which can be divided and subdivided into laminae apparently without limit. In estimating the hardness of a mineral, the direction of C. should be taken into account, as a crystal shows less resistance to abrasion in a direction parallel to the C. The C. of non-crystalline rocks is often due to quite different causes. Rocks composed of coarse particles are either not cleavable or cleave in a direction parallel to the bedding planes. Fine-grained rocks, on the other hand, often exhibit a phenomenon known as slaty C. This occurs in a direction usually at a high angle to the bedding plane, and at right angles to some folding stress which the rock has at some time sustained. The cause is somewhat obscure, but there would naturally be a tendency for the particles to flatten themselves in a direction at right angles to the greatest stress. Again, slate contains plates or crystals of mica; these developed while the rock was in a plastic state and would tend to grow at the edges where the pressure was less intense, thus forming laminae whose direction would be parallel to the line of C. The property of C. in slate is of economic importance, as through it the rock may be readily split into plates suitable for roofing, etc.

Cleavers, or Goose-grass, *Galium Aparine*, ann. wayside weed of the order Rubiaceæ. Has small white flowers and bristly purple fruits which cling to wool or fur.

Cleburne, city of Texas state in the U.S.A., the cap. of Johnson co., situated 55 m. S.W. of Dallas. Pop. 10,500.

Cleekheaton, par. and tn. of the W. Riding of Yorkshire, England, 5½ m. S.E. of Bradford. The tn. has a very fine tn. hall, and industries of textile fabric

manuf. and machine-making; there are collieries in the dist. The par. has an area of 1750 ac. Pop. 13,000.

Clee Hills, range of hills situated in S. Shropshire, which rise here and there into fairly high peaks, of which the chief are Brown Clee Hill (1792 ft.) and Titterstone Clee Hill (1750 ft.). There is some coal in the dist., and a noted hard rock called Dhu stone is quarried in large quantities.

Clethorpes, watering-place of Lincolnshire, England, situated 2½ m. S. of Great Grimsby, on a flat, sandy beach at the mouth of the Humber, here over 7 m. wide. There is a sea wall of nearly a mile in length, and C. is connected with Grimsby by train. The tn. is noted for its oysters. Pop. 27,100.

Clef, in music, a character placed at the beginning of the staff to determine the pitch and name of the notes. There are three Cs.: the G, or treble C., placed on the second line; the C clef, placed on the fourth line; and the F, or bass C., placed on the fourth line. The C clef is now only used for tenor and alto staves, though formerly it was of four kinds. As the alto staff it may also be placed on the third line.

Cleft Palate, congenital failure of development in the roof of the mouth, resulting in a fissure which may extend along the middle line of the hard palate and soft palate as far as the uvula. The reason for such lack of development is not known; it is often hereditary and frequently associated with hare-lip, where the upper lip is divided on one side, or on both sides, of the middle line. The condition, whether of C. P., or hare-lip, or both combined, is one dangerous to the welfare of the child, as swallowing is rendered difficult and sucking is rendered impossible, or results in the return of the milk through the nasal passages. In later years an additional disability is sustained through the impossibility of rendering some of the elements of speech, and the senses of taste, smell, and hearing may be considerably impaired. These considerations make an early operation advisable, and if the child is able to undergo a surgical operation, the matter should be attended to when it is a few weeks old. The plan adopted is to bring the edges of the soft palate together and to thrust forward strips of the mucous membrane and fibrous tissue covering the hard palate to meet at the middle line, where they are sewn up. If hare-lip exists, the gap should be closed by surgical operation as soon as possible. Where there is no C. P., the operation may be undertaken a week after birth, but is necessarily postponed for some months after the palate has to be operated on. Formerly artificial palates were used to cover the fissure, but with modern surgical methods this is rendered unnecessary.

Cleg, **Horse-fly**, **Breeze-fly**, **Forest-fly**, and **Gadfly** are various names given to members of the family of dipterous insects, Tabanidae. They are large, stout flies, with a very long proboscis, and the males have enormous eyes. In the genus *Tabanus*, common in Britain, the species are often one inch in length, and in the

Pangonia the proboscis of the female is about four times the length of its body. See also **CIRRYSOPE**; **HORSE FLY**.

Cleisthenes (fl. 508 B.C.), Athenian reformer, the son of Megacles and Agariste, and grandson of Cleisthenes, the tyrant of Sicyon. He was the leader of the Alcmaeonidae, and after the expulsion of the Pisistratids (510 B.C.), headed the democratic party. He was opposed by the whole party of nobles, and in particular by Hippas and Isagoras, the former of whom he expelled in accordance with the Delphic oracle. C.'s chief reforms were (1) the abolition of the four ancient tribes and the substitution of ten new ones; (2) the introduction of ostracism, by which a party leader might be got rid of without resorting to bloodshed; (3) the re-establishment of election by lot. Isagoras called in the help of the Spartans, and for a time C. was obliged to withdraw from Athens, but Isagoras was ultimately defeated, and C. was recalled and his laws made good.

Cleithros, in architecture, a covered, or roofed-in, Gk. temple, the open-roofed temple being known as hypæthral.

Cleitus, see **CLITUS**.

Cleland, small tn. of Lanarkshire, Scotland, on S. Calder Water, situated 3 m. N.E. of Motherwell. There are collieries and iron works. Pop. (including the small suburb Omoa), 5000.

Cleland, William (c. 1661-89), Scottish soldier and poet, was brought up on the estate of the marquess of Douglas, to whom his father was gamekeeper. He joined the Covenanters, with whom he fought at Drumelg and Bothwell Bridge. Later, he was agent for William of Orange, and was made lieutenant-colonel of the Cameronian regiment which defended Dunkeld; he was there killed. His poems are written in Eng., with a plentiful sprinkling of Scottish words, but have no great literary merit.

Clematis, cosmopolitan genus of Ranunculaceæ, consists largely of shrubs which have opposite leaves and climb by means of their petioles. *C. vitalba*, the traveller's joy or old man's beard, runs over the hedges in many parts of Britain. The greenish-white flowers are in clusters and later appear as heaps of feather-tailed silky tufts. Other species are, however, better known in cultivation, e.g. *C. flammula*, a fragrant plant with panicles of small white flowers; *C. cirrhosa*, *C. crispa*, and *C. florida*, all remarkable for the large size of their greenish-white flowers; *C. viticella*, an elegant and ornamental climber, which has purple or pink bells hanging gracefully from the festooning branches. The popular *C. jackmani* with purple velvety blooms is derived from *C. viticella* and *C. lanuginosa*, a large lilac-coloured species of Chinese origin. There are also American species which have the popular name virgin's bower.

Clemenceau, **Georges Benjamin** (1841-1929), Fr. statesman and journalist and the dominating figure in France during the First World War, b. at Mouilleron-en-Pareds, his father being an uncompromising Jacobin of the Vendée from

whom C. inherited his republican principles and his intransigence. His forbears having been in the medical profession for the previous three hundred years, C. studied medicine, first at Nantes and then in Paris, where he took his degree. At the uliv. he was a firebrand republican, remarkable for his polemics against Bonapartism. He was imprisoned for two months for celebrating the Feb. revolution in the Bastille square. Went to U.S.A. to study Amer. sociological conditions, maintaining himself by

another. He brought about the fall of the Gambetta Cabinet in 1882, that of Ferry in 1885, and that of Brisson in 1886. Another victim was Boulanger during the Panama scandals, when C. was animadverted upon as the great corrupter; but when proofs were eventually forthcoming they were definitely estab. to be crude forgeries by one Norton, who committed suicide in gaol. In 1893 he took to journalism, collaborating in the editing of the *Écho de Paris*, *Figaro*, and other journals, and starting his own paper, *La Justice*. He was chief editor of *L'Aurore* in 1897 during the most famous period of his journalistic activities when he headed the campaign in favour of Dreyfus (q.v.).

In the Radical struggle against Rome he succeeded Sarrien as premier, but in 1909, after three years of office, his gov. was defeated after a violent debate in which he accused Delcassé of humiliating France in the Algeiras affair (q.v.). But his gov. had been very successful; he had ruled labour with firmness, as was proved during the strike of miners in the Pas-de-Calais in 1906, when he showed the iron hand by employing the military. It is true that he thereby alienated the sympathy of the Socialist party, but he had emerged as the strong man of France, an emergence which he was destined to repeat in the First World War with most dramatic effect. He had, besides, greatly enhanced Fr. prestige abroad, especially by his firm attitude towards Germany. His desire to redress the wrong done by Germany over Alsace-Lorraine was lifelong. His foreign policy was in line with the traditional Fr. view that their country's destiny was in the chancelleries of Europe and, consistently with this, he was an opponent of Fr. colonial expansion in rivalry with Britain. But if, during all his early and middle political career, he was the rebellious spirit and the iconoclast in Fr. politics, he flamed forth in the First World War as a single-minded patriot, whose fulminations in *L'Homme libre* breathed a noble love of country, and throughout the war he showed a truly extraordinary energy both physical and mental, and, as has been well said, he became long before his death almost a legendary figure. Early in the war he vented his burning anger against the administration for the state of the Army and the inadequacy of the medical service; and the failure of each gov. to grapple with the problems of the war goaded him to such a pitch of fury that both as editor of *L'Homme libre* and as a senator he was the veritable scourge of the gov. The strength of his position lay partly in the negative fact that he was no petty intriguer manoeuvring for place or even for power. Defeatism was in the political air of France, and after the Salonika failure of Sarrail, the Poincaré Cabinet was driven from office and C., almost in spite of himself, was in undisputed power. Previously, his paper *L'Homme libre*, had been suppressed, his answer to which abuse of emergency powers was to produce a new paper ironically entitled *L'Homme enchaîné!*



Topical Press

M. CLEMENCEAU

teaching in a young ladies' school in Connecticut, whence he brought back to France his wife, Miss Mary Plummer, one of his pupils. Set up as a physician in Montmartre and became prominent in the revolution of 1870 at which period he was mayor of Montmartre and a deputy for Paris. He was vehemently attacked by both the Paris revolutionaries and the National Assembly in connection with the shooting, by the Communists, of two generals whom Thiers had dispatched to restore order in Montmartre. In 1870 as the representative of Paris in the Deputies, his biting eloquence marked him out as the radical spokesman. The revolutionaries had become bourgeois, but C. would have no compromise. Democratic to the core, he wanted political reconstruction, and thenceforth he was essentially the destroying force in Fr. politics—overthrowing with mordant wit and unflagging energy one gov. after

But the time, however, was ripe for a man of resolution. France was weary of intrigue. The names of Holo, Malvy, Caillaux, and Charles Humbert had created uneasiness in allied countries, and tendencies to mutiny in the Army made it plain that the iron hand was wanted once more. Hence the formation of the Victory Cabinet in 1917 under C.'s celebrated slogan 'Je combattrai devant Paris. Je combattrai à Paris. Je combattrai derrière Paris.' In March 1918, during the dark days of the final Ger. offensive, he supported Lord Milner in the decision to appoint Marshal Foch as generalissimo of the allied armies. His endurance showed no abatement even after the war, for he presided and directed the proceedings at the Peace Conference in Paris in 1919, where he was tenacious of Fr. security. In this he was opposed to President Wilson's self-determinist views, and more than once waxed bitterly ironic over the latter's famous 'fourteen points.' Yet he forbore to carry his policy *à outrance*, and for the most part his keen sense of altered political values kept him in general agreement with Mr. Lloyd George. This equisense was especially fruitful in the decision of the Big Four (Clemenceau, Wilson, Lloyd George, and Orlandi) to foster the growth of new or enlarged states in Central and E. Europe, though in this policy C., more than the other three, was actuated chiefly by the desire to create buffer states against Germany, whereas President Wilson and Mr. Lloyd George were concerned rather with removing causes of friction by the application of the principle of self-determination. C. persuaded both President Wilson and Mr. Lloyd George to sign treaties binding their nations to aid France against unprovoked aggression, but the treaties lapsed through the refusal of the Amer. Senate to ratify. In conveying to the Ger. representatives the terms of the treaty, which he did in a few curt words, C. permitted no oral discussion. His subsequent reply to the written Ger. observations was a brilliant document, the purport of which was that no peace could be founded on a condonation of the war which Germany had brought about and that reparation by Germany was a *sine qua non* of justice. During the conference in Feb. 1919 he was shot at and wounded by a young anarchist, but with a Stoic coolness he was soon at work again, delighting his colleagues with his wit and amazing energy. In 1920, after entering the political sphere again, he withdrew his candidature, recognising that his work was done, and spent some time in touring Egypt and India. His remaining years were passed at his quiet seaside house La Tranche, near Ste. Hermine in the Vendée, and in Paris in contributing articles and in writing a small book on Demosthenes. In his last illness he rallied more than once, and it was as if the Tiger, to give him his universal sobriquet, would defeat even death. It has been well said of him that, like Foch, he fired the soul of France and stole her will. His pub. works include

also *De la génération des éléments anatomiques*; *La Mêlée sociale* (1894); *Le Grand Pan* (1895); *Le Voile du bonheur* (1901); *Les Plus Forts* (1898); *Les Requins* (a play); *Grandeurs et misères d'une victoire* (memoirs) (1929); *Au soir de la pensée* (on philosophy and morals) (1927) (trans. *In the Evening of my Thought*, 1929). See also Clemenceau: *The Events of his Life as told by himself to his former secretary, Jean Martel*, trans. by M. Waldman, 1930; G. Adam, *The Tiger: Georges Clemenceau, 1811-1929*, 1930; G. Braun, *Clemenceau*, 1943.

Clemence Isaure, Fr. poetess, b. near Toulouse towards the early part of the fifteenth century. Guillaume Benoit, a jurist of the fifteenth century, ascribes to her the *Jeux floraux*, held at Toulouse on May 3. There is a statue of her at Toulouse and another in the Jardin du Luxembourg, Paris.

Clemens, Samuel Langhorne (1835-1910), Amer. novelist and humorist, better known by his pen-name of Mark Twain, was b. at Florida, Missouri, U.S.A., and after an ordinary school education in his native tn., learnt the trade of a printer, at which he worked at St. Louis, New York, and other tns. In 1851 he gave up this trade and became a steamboat pilot on the Mississippi, and it was from a cry used in taking soundings here that his pseudonym was taken. On the outbreak of the Civil war he gave up this position and went to Nevada, becoming editor of the *Enterprise* at Virginia City. He also tried mining, journalism, and lecturing. In 1867 the *Jumping Frog*, etc., proved a sufficient success to enable him to make a tour through Europe, the account of which in *Innocents Abroad* (1869) firmly estab. his reputation as a humorist. From this time till 1871 he edited the *Buffalo Express*. In 1872 appeared *Roughing It*, where he made use of his experiences in the Far West. In 1874 came *The Gilded Age*, written in collaboration with C. W. Warner. Then appeared *The Adventures of Tom Sawyer* (1876); *A Tramp Abroad* (1880); *The Prince and the Pauper* (1882); *Life on the Mississippi* (1883); *The Adventures of Huckleberry Finn* (1884); *Pudd'nhead Wilson* (1894); *Personal Recollections of Joan of Arc* (1896); *More Tramps Abroad* (1897); *Eve's Diary* (1906); and others up to *The Mysterious Stranger: a Romance* (1916). In 1884 he had joined the publishing firm of Charles L. Webster & Co., and the failure of this concern in 1895 led to his making a lecture tour round the world which estab. his fortune once more. From this time till after 1900 he lived principally in Europe. His humour is spontaneous and free, and is varied by amusing character-sketches, grotesquely exaggerated. The picaresque novel is his favourite element. His *Autobiography of Mark Twain* was compiled and ed. by Albert Bigelow Paine (1924). See A. B. Paine, *Mark Twain, a Biography*, 1912; Van Wyck Brooks, *The Ordeal of Mark Twain*, 1920; C. Clemens, *My Father, Mark Twain*, 1931; S. Leacock, *Mark Twain*, 1933.

Clemens, Titus Flavius Alexandrinus (**Clement of Alexandria**) (b. c. A. D. 150), distinguished Christian writer. He is believed to have been b. at Athens, but spent most of his life in Alexandria, where he studied under Pantænus. During the persecutions of Severus, he and his master were obliged to take refuge in Palestine (c. 202-6), and in 211 he succeeded Pantænus as master of the school of Alexandria. The extant works of C. are *Λόγος προτρεπτικός πρὸς Ἕλληνας*, *Παιδαγωγός*, *Στρωματεῖς*, and *Τὴς ὁ σωόμενος πλούσιος*. His works have been frequently pub., the best being one with a Lat. trans. by J. Potter (1715).

Clement, the name of fourteen popes:

Clement I., commonly known as C. of Rome (fl. A. D. 90). He is thought by some to be identical with C., the fellow-worker of Paul (see Phil. iv. 3). He succeeded Anacletus as bishop of Rome. He was the author of the *First Epistle of Clement*, written to the church at Corinth about A. D. 95. This early document is of great value to the student of primitive Church hist. A fragment of it was found at the end of the *Codex Alexandrinus*, and was pub. in 1633 by Patrick Young (Patricius Junius). A complete MS. found at Constantinople was pub. in 1875. Sev. other documents have, with little or no authority, been attributed to this C. Consult J. B. Lightfoot, *The Apostolic Fathers*, vol. I., *S. Clement of Rome*, 1869, 1877; J. A. F. Gregg, *The Epistle of Saint Clement*, 1899.

Clement II. (1046-47), formerly Sudiger, the chancellor of Emperor Henry III., who created him pope.

Clement III. (1187-91). Paolo Scolari, cardinal-bishop of Palestrina; urged the necessity of the third crusade upon Henry II. of England and Philip Augustus.

Clement IV. (1265-68), Guy Foulques le Gros, of a noble Provencal family, began life as a soldier, but later became cardinal-bishop of Sabina. He supported the claim of Charles of Anjou in Sicily, and was a friend to Roger Bacon.

Clement V. (1305-14), Bertrand de Goth, was unduly influenced by Philip the Fair, at whose suggestion he suppressed the Order of Templars. He removed the papal seat to Avignon. Consult Rabines, *Clement V. et Philippe le Bel* (1858).

Clement VI. (1342-52), Pierre Roger, a Frenchman, archbishop of Rouen. He took the part of Queen Joanna of Naples against her brother-in-law, Louis of Hungary, who had invaded her dominions to avenge the murder of her husband.

Clement VII. (1523-34), Giulio de' Medici. After the battle of Pavia (1525) he joined the It. cities in a Holy Alliance with France against the Emperor Charles V., but in 1527 Rome was sacked by the imperial troops, and he was kept prisoner in the castle of Sant' Angelo for six months. He refused to sanction Henry VIII.'s divorce from Catherine, which fact brought about the Reformation in England.

Clement VIII. (1592-1605), Ippolito

Aldobrandini, received the public profession of Catholicism made by Henry IV. of France, whom he reconciled with his subjects. He annexed the duchy of Ferrara to the papal states.

Clement IX. (1667-69), Giulio Rospigliosi, brought about the peace of Aix-la-Chapelle in 1668 between France and Spain; and for a while conciliated the Jansenists and Jesuits in France.

Clement X. (1670-76), Emilio Altieri, was eighty years of age at the time of his election, and left the administration of affairs to his adopted nephew, Cardinal Paluzzo Paluzzi.

Clement XI. (1700-21), Gian Francesco Albani, had trouble with the Jansenists in France, against whom he issued two bulls, *Ineam Domini Sabaoth* (1705) and *Unigenitus* (1713).

Clement XII. (1730-40), Lorenzo Corsini, condemned the Freemasons (1738), and restored the republic of San Marino to its liberties (1740).

Clement XIII. (1758-69), Carlo Rezzonico, endeavoured with little success, to support the Jesuit missionaries, but before his death they were expelled from France, Spain, and Portugal.

Clement XIV. (1769-74), Giovanni Vincenzo Antonio Ganganelli, succeeded C. XIII. in troublous times. After vain negotiation, he issued his famous brief, *Dominus ac Redemptor noster*, suppressing the Jesuits (1773). He was a liberal-minded statesman and a patron of art. He founded the Clementine Museum in the Vatican. Consult Ravikan, *Clement XIII. et Clement XIV.* (1851), and Uschner, *Clement XIV.* (1867).

Clement of Alexandria, see CLEMENS, TITUS FLAVIUS ALEXANDRINUS.

Clement (Frédéric Jean) Edmond (1867-1928), Fr. operatic tenor, b. in Paris. Studied under Warot at the Conservatoire. Made début at Opéra Comique in 1889 in *Mireille*, and, except for tours, remained with that house for life. Sang also at the Metropolitan Opera House, New York, and with the Boston Opera Company. His best parts were Don Jose (*Carmen*), Werther (in Massenet's opera), Dec Gricux (*Manon Lescaut*), Rodolfo (*La Bohème*), and Gerald (*Lakmé*).

Clement, Jacques (1564-89), Dominican friar, notorious as the murderer of Henry III. of France. He was himself killed by Henry's attendants, and was regarded as a martyr.

Clementi, Muzio (1752-1832), pianist and composer, b. at Rome, where he studied as a child under Cordicelli, and at the age of nine was appointed to a post as organist. He afterwards studied under Santarelli and Carpani, and by the age of fourteen had composed sev. contrapuntal works. He attracted the attention of Peter Beckford an M. P., who brought him to England, where C. continued to pursue his studies until the year 1773 when he made his début. He conducted the Royal It. Opera (1777-80); he then made a continental tour, and while at Vienna had a piano combat with Mozart, the victory being left undecided. On his return to England he founded a business

as pianoforte-maker and musical publisher in London. In 1813 he assisted in forming the Philharmonic concerts. C. left about a hundred sonatas, symphonies, and overtures, and was regarded as the father of modern pianoforte technique. His best known pieces are the *Op. 2* (1773) three sonatas which may be said to have established the form of the piano sonata, and *Gradus ad Parnassum* (1817)—a collection of progressive studies, which have remained the foundation of all piano technique (Thompson). He is buried in the cloisters of Westminster Abbey.

Clemmensen Reduction, in chem. a method of reduction (see REDUCING AGENT), applicable to a number of organic compounds, especially to aromatic ketones and secondary alcohols. It is named after the discoverer. The substance to be reduced is boiled in aqueous suspension or aqueous alcoholic solution with amalgamated zinc or zinc wool with sufficient hydrochloric acid to maintain its concentration above 6N. The presence of nitro or amino groups renders the reduction unsatisfactory. See also BENZOIN.

Clement's Inn, formerly an inn of chanery; took its name from the church of St. Clement Danes, which stands in the Strand, London, opposite the street called C. I. A considerable part of the former site of the inn is now occupied by the Law Courts, while its functions as an inn of Court are now performed by the Inner Temple.

Cleobis, see BITON AND CLEOBIS.

Cleobulus of Lindus in Rhodes, one of the Seven Sages; he lived about 560 B.C. He was distinguished for his strength, handsome person, and famous riddles.

Cleombrotus I. (380-371 B.C.), king of Sparta, brother and successor of Agesipolis. He waged war against the Thebans; in 371 B.C. he led the Spartans at Leuctra against the Thebans under Epaminondas, and was defeated and mortally wounded.

Cleombrotus II. (c. 243-240 B.C.), thirtieth king of Sparta. On the expulsion of his father-in-law, Leonidas II., he was elected king by the party of Agis IV. On his return, three years later, C. was deposed and banished to Tegea.

Cleomedes, (Gk. mathematician, who probably flourished in the second century A.D. He wrote, in two books, a treatise *On the Circular Theory of the Heavenly Bodies*. It sets forth the Stoic system of the universe, and gives various arguments in proof of the rotundity of the earth. Ed. by BAKE (1820) and ZIEGLER (1891).

Cleomenes I. (520-491 B.C.), king of Sparta, son of Anaxandrides. In 510 B.C. he took part in the expulsion of Hippas, the last of the Pisistratids, from Athens. His assistance was called for by Isagoras and the aristocratical party in Athens against Cleisthenes, and he helped in the expulsion of 700 families. During the war with Argos he was successful in defeating the Argives near Thyrea.

Cleomenes II. (370-309 B.C.), king of Sparta, succeeded his brother Agesipolis III.

Cleomenes III. (c. 235-220 B.C.), king of Sparta, son of Leonidas II., last of the Agiads. He endeavoured to restore the ancient institutions of Lycurgus and strongly opposed Aratus and the Achaean League, by forming an alliance with Ptolemy, king of Egypt. He was at first successful in his campaigns against the Achaeans, but in 221 he was himself defeated at Sellasia in Laconica.

Cleon (d. 422 B.C.), Athenian democrat, the son of Cleaneus. He was originally a tanner, and came forward into public life as an opponent of Pericles. During the Peloponnesian war, C. set himself up as the champion of the people and the leader of the peace party (428-422). In 427 he advocated in the assembly that the Mytilenean prisoners, sent to Athens by Paches, should be put to death, and in 424 he won great glory by his capture of the Spartans on the is. of Sphacteria. Much elated by his success, C. accepted the command of the Athenian army to oppose Brasidas in Macedonia and Thrace, but was defeated, and fell in battle under the walls of Amphipolis. C. is represented by Thucydides and Aristophanes as a demagogue of the lowest type, mean, ignorant, cowardly, self-seeking, and unscrupulous, pandering to the mob to obtain his own selfish ends. He is made to figure among the *dramatis personae* in Aristophanes' comedy, *The Knights*, but the poet was obliged to take the part himself as he could find no actor bold enough to personate C. It should, however, be remembered that both Thucydides and Aristophanes had a grudge against him, the former having been banished at his instance, and the latter's comedy, *The Babylonians*, was brought before the notice of the Senate by C. as an unpatriotic play and harmful to the country in time of war.

Cleonus, genus of Curculionidae, or weevils, consists of between one and two hundred species of beetles. They have elongated and convex bodies, and both larvae and perfect insects are vegetarian, feeding chiefly on coniferous trees, such as the larch and pine.

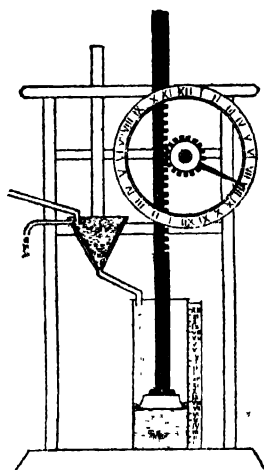
Cleopatra (51-30 B.C.), famous queen of Egypt. She was the eldest daughter of Ptolemy XIII., Auletes, and was b. in 69 or 68 B.C. Her father d. in 51, appointing her and her younger brother, Ptolemy, joint heirs of his kingdom, on the condition that they should marry. The will was ratified by the Rom. senate and C. ascended the throne at the age of seventeen. Two years later Ptolemy XIV., with the aid of his guardians, Pothinus and Achillas, drove his sister out of Egypt. She retreated to Syria to collect her forces, but in 47 Caesar arrived at Alexandria in pursuit of Pompey, and C. had little difficulty in exercising her fascinations over the susceptible Roman. Caesar became her lover and advocate, and, though repulsed at first, he ultimately defeated the Egyptians and reinstated C. on the throne. During the Alexandrine war Ptolemy XII. had perished, and accordingly C., with Caesar's advice, divided the rule with a

younger brother, Ptolemy XIII., whom she nominally married. C. remained the mistress of Caesar, and accompanied him to Rome, where she apparently was living at the time of his assassination in 44. On her return to Egypt, C. is supposed to have murdered her brother, and declared Caesarion, her son by Caesar, joint ruler of Egypt. In 41, during the civil war that followed Caesar's death, she met Antony in Cilicia, who fell a captive to her charms and became her infatuated lover and slave. From political motives Antony was obliged to return to Rome and marry Octavia, the sister of Augustus but he speedily returned to his mistress. Antony divorced his wife, and open war was declared between C. and Augustus. She was present with her lover at the naval battle of Actium (31), but, fearing the worst, retreated with her fleet to Alexandria. Antony was defeated, and, hearing a rumour of the queen's death, stabbed himself. C. made overtures to Augustus, but was unable to fascinate him, and, in order to avoid being led in triumph through Rome as a captive at the wheel of his chariot, she killed herself by a poisoned comb, or, traditionally, by an asp in her bosom (30). C. was a woman of great intellectual power and boundless ambition, and was quite unscrupulous in using her physical charms to attain her own ends. Her beauty and her fascinating personality have bewitched men throughout the ages, and have inspired poetry that is unsurpassed in the world's literature. See A. Stahr, *Cleopatra*, 1879; G. B. Shaw, *Cæsar and Cleopatra*, 1898; Sir J. P. Mahaffy, *History of Egypt under the Ptolemaic Dynasty*, 1899; P. W. Sergeant, *Cleopatra of Egypt*, 1909.

Cleopatra's Needles, two granite obelisks erected by Thothmes III. at Heliopolis in Egypt (c. 1475 B.C.) and re-erected by Ramses II. at Alexandria. During the removal to Alexandria the lower part broke away, and the Rom. engineers supported the angles on bronze slabs, one of which with three reproductions still supports the angles of the needle or obelisk which was placed on the Victoria Embankment in 1878. This needle weighs 186 tons and is 68½ ft. high. The other was presented by the khedive to the U.S.A., and in 1881 was erected in Central Park, New York.

Clepsydra, or water-clock, instrument for measuring time by the flow of water, which seems to have been in use among the Babylonians, Hindus, and Egyptians from the earliest times, and was regularly employed among the Gks. and Romans. It appears to have taken sev. forms. One of the earliest types was a copper vessel, having a small hole in the bottom, which was set to float in a vessel of water, and which necessarily sank within a certain time. The Gks. and Romans had a form somewhat resembling a sand-glass, and consisting of a pierced globe, through which the water gradually escaped. This was used to limit the length of the speeches in courts of law. Later, since the rate of flow lessened as the vessel grew empty, the globe was kept filled

with water, and that which escaped measured. Another type measured time by the rising of a float on water which was increased by a slow regular inflow, a constant and uniform supply being ensured by an intermediate cistern. All these were subject to variations caused by differences of atmospheric temp. and pressure, and also some arrangement was necessary to obviate the difficulty caused by the fact that an hour, being a twelfth part of the time from sunrise to sunset, varied with the season. The most successful invention to meet this seems to have been made by Ctesibius of Alexandria about 135 A.C.



CLEPSYDRA

Clercken, small tn. of Belgium, situated in W. Flanders, about 20 m. S.W. of Bruges. Pop. 3500.

Clerestory (also *Clear-story*; Fr. *claire-voie*), term used in architecture to denote the windows in the upper part of the central nave of a church. Its purpose is to admit clear light, and this method of lighting was constantly used by the Romans in their baths and palaces.

Clergy (from Low Lat. *clericatus*, which is derived from Gk. κληρος, an inheritance) is a collective term signifying men in holy orders. In the N.T. the Gk. word is used indifferently of the apostolic order and of the sev. congregations of the Christian Church. But very early the priests came to regard themselves as being peculiarly God's heritage, as opposed to the faithful people or laity (Gk. λαός) who were members of the Church. This distinction between C. and laity was accentuated by the adoption of sacerdotal vestments and official insignia, by the introduction of the tonsure, by the institution of monastic orders and of various titles and offices, and

above all by the growing tendency to regard ordination as the outward sign of a direct call from God, and as conferring privileges which could not be renounced without apostasy. But after the Reformation this distinction, which is still very strongly marked in the Rom. Catholic Church, was purposely diminished in Protestant communities. Thus in the Church of England to-day the ordinary garb of the C.; the cassock, for example, is peculiar only in so far as laymen have long ago discarded it through change in fashion. Moreover, the term C. has broadened in meaning so as to be applied frequently to nonconformist ministers, although 'clergyman' still properly refers only to priests of the Estab. Church. In the Middle Ages the claims insistently advanced by the papacy that, in its capacity of ruler over men's souls, it was above the merely temporal power of any sovereign, led as a natural corollary to the theory that the C., by virtue of their office, were entitled to many special immunities. Thus the C. claimed exemption from public burdens, from taxation as well as from civil office, and above all they insisted on their right to have eccles. courts instead of being subject to the ordinary lay jurisdiction. The result was that the offences of clerks were dealt with much more leniently than those of laymen. The major orders, including bishop, priest, deacon, and sub-deacon, are distinguished as the higher, whilst lectors, acolytes, etc., are the lower C. The C. are still technically one of the three estates of the realm. Though bishops, however, sit in the House of Lords, they do so by reason of the baronies attached to their sees and not because they are Church dignitaries.

Clergy, Benefit of, see BENEFIT OF CLEROV.

Clergy Discipline Act, 1892, relates to the consequences of crimes or offences against morality by clergymen, and, in regard to the latter, provided a new form of procedure. The Act is divided into two parts, the first of which renders a beneficed clergyman liable to deprivation who is convicted in temporal court of an indictable offence, or against whom a bastardy order has been made, or adultery found in a divorce suit. The second part of the Act provides that a clergyman convicted by a temporal court of an act constituting an eccles. offence, or against whom any immoral act, conduct, or habit, being an offence against morality and not doctrine or ritual, is alleged, may be prosecuted by any of the parishioners of the par. in which he holds preferment, or by the bishop of the diocese, or a person approved by the bishop, and tried in the consistory court of the diocese. A conviction under the Act enables the bishop to treat preferment of the convicted clergyman as void, while conviction for an immoral act under the second part of the Act renders the clergyman liable, subject to an appeal to the king in council, either to suspension or deprivation, with incapacity to hold another preferment. A clergyman may be re-

instituted if pardoned by the Crown and if the benefice has not been filled.

Clergymen, Deposition of, see DEPOSITION.

Clericis Laicos, first words of a bull of Pope Boniface VIII. (1294-1303). His arrogance made him many foes, his most noted conflict being that with Philip IV. of France. In 1296, by the bull named C. L., the pope forbade the levying of taxes, however disguised, on the clergy without his consent. Boniface was forced to recede from his position, and canonised Louis IX. Hostilities were later renewed, and in 1302 Boniface drafted and pub. himself the bull 'Unam Sanctam,' one of the strongest official statements of the papal prerogative ever made.

Clericus, Johannes, see LE CLERC, JEAN.
Cleridae, family of coleopterous insects, consists of numerous and very varied species, a few of which are Brit. The body is generally cylindrical, the eyes emarginated, the antennae usually terminated by a club. Most of the beetles are found on flowers, and some on old trees, but the larvae are often carnivorous.

Clerihew (from E. *Clerihew* Bentley), short nonsensical or satirical poem, usually of four lines of varying length, e.g.:

Sir Christopher Wren

Said, 'I'm going to dine with some men.

If any one calls

Say I'm designing St. Paul's.'

Clerk (from Lat. *clericus*, which comes from the Gk. *κλῆρος*, a lot, or inheritance), was at first a synonym of canon, and was used indifferently of all who were servants of the Church. Soon the term C. was used only of one in a minor as opposed to major or holy order. But C., in holy orders is still the legal designation of clergymen of the Eng. Church. After the Reformation it was applied to members of the laity who assisted at baptisms, marriages, etc., and who led the responses for the congregation. In this sense the C. became known as the par. C. But the word has had another distinct, though parallel, development. Chaucer's poor 'clerk of Oxenford' was, above all, a devotee of learning. This sense of the term arose from the fact that in medieval times learning was confined to the clergy. Now this meaning is narrowed down and is applied especially to servants of corporations and courts who keep the records, to lawyers' assistants and to all employees who write, make entries, and discharge the correspondence of any firm or company. In America a C. is also a retail salesman. The word is thus an example of the many whose meaning has deteriorated.

Clerk, John (1728-1812), author of *Essay on Naval Tactics*, worked on his estate of Eldin at geology and etching, besides his new theories of naval manœuvres. His naval names were adopted with complete success in 1782 when Lord Rodney gained a complete victory at sea over the Fr. His essay was not pub. entire till 1804.

Clerke, Agnes Mary (1842-1907), Eng. astronomer and scientist, b. in London. Although not a practical astronomer in the true meaning of the word, she was endowed with remarkable talent for collecting and summarising results of scientific and astronomical research. Her chief works, which, however, are now out of date, are *A Popular History of Astronomy during the Nineteenth Century* (1885); *The System of the Stars* (1890); *Problems in Astrophysics* (1903).

Clerkenwell, dist. in the N. of London within the metropolitan bor. of Finsbury. It is so called from a well in Foy Street, near which the par. clerks occasionally acted mystery plays. The well is at what is now 18 Farringdon Street. In St. John's par. are the remains of the priory of the Knights of St. John of Jerusalem. A jail called the C. Bridewell was built here in 1615 for the punishment of rogues and vagabonds of Middlesex; it was burnt down in 1669 but was rebuilt. The prison built in 1775, called the House of Detention, was notorious as the scene of a Fenian outrage in 1867. Watch-making was for a long period a very important industry and is still carried on to a degree.

Clerk-Maxwell, see MAXWELL, JAMES CLERK.

Clermont-en-Beauvais, tn. of France, dept. of Oise, on r. b. of the brèche, 41 m. N.E. of Paris. The *hôtel de ville*, built by Charles IV. (b. 1294), is the oldest in the N. of France, and was founded during the Norman invasion. One-fifth of the tn.'s buildings were damaged or destroyed in the Second World War. Pop. 5500.

Clermont. The, was one of the earliest steamships. Its inventor and builder was an Amer., Robert Fulton (1765-1815), who in 1803 obtained jointly with Robert Livingston the exclusive privilege of navigating with steamers the waters of New York. The engines of the C. were provided by Boulton & Watt of Birmingham, and it traded on the Hudson between Albany and New York from 1807 onward.

Clermont-Ferrand (the anct. Augustonemetum, the chief city of the Arverni), cap. of the dept. Puy-de-Dôme, central France. The two tns. of which it is composed, C. and Mont-Ferrand, which are connected by a fine promenade, have grown up on the slopes of a small eminence. Its Gothic cathedral has fine stained glass of the thirteenth but it was not completed till the nineteenth century. In the cathedral square stands a statue of Pope Urban II., who here made in 1095 his memorable proclamation of the first crusade. The Romanesque church of Notre-Dame du Port is an eleventh-century structure. It is the seat of a bishopric, and from A.D. 535 to 1130 was the meeting-place of seven eccl. councils. The present name occurs as early as the eighth century, but was at first applied to the castle alone, in the Rom. form *Clarus Mons* or *Clarimontium*. The chief manufs. are those of rubber goods and tyres, macaroni, semolina, preserved fruits and jams, chemical

products, boots and shoes, and linen and woollen goods. It has handsome squares, is an educational centre, and is famous also as the bp. of Pascal. Pop. 108,000.

Clermont-Ganneau, Charles Simon (1846-1923), Fr. orientalist, b. in Paris. His father was a sculptor of some repute. Ganneau was educated at the *École des Langues Orientales*, and afterwards entered the diplomatic service as dragoman to the consulate at Jerusalem, where he inaugurated his archaeological pursuits by the discovery and trans. of a theretofore unpublished story in the *Thousand and One Nights* (see below). Soon afterwards he occupied a similar position at Alexandria. In 1870 he discovered the *stèle* of Mesha, a stone bearing the oldest Semitic inscription known. He commanded a Brit. archaeological expedition to Palestine in 1874, and later a Fr. expedition to the Red Sea and Syria. Chevalier of the Legion of Honour 1875; vice-consul at Jaffa, 1880-1882. Subsequently he became director of the *École des Langues Orientales*. He became consul-general in 1896, and minister plenipotentiary in 1906. His chief publs. include *La Palestine inconnue* (1886); *Études d'archéologie orientale* (1880); *Les Fraudes archéologiques* (1885); and *Recueil d'archéologie orientale* (1885-1924). He was principally instrumental in exposing the Shapira forgeries of Heb. texts offered to Brit. Museum; other frauds were the Monbte potteries and the tiara of Saitaphernes (see his *Les Fraudes archéologiques* above).

Clermont l'Hérault, tn. in the dept. of Hérault, S. France, 11 m. S.S.E. of Lodève. Pop. 5600.

Clerodendron, genus of Verbenaceae, flourishes in its wild state in tropical and warm climates, but in Britain grows only in greenhouses. *C. Thompsonæ* is a commonly cultivated evergreen plant which bears red and white flowers. *C. fragrans* and *C. trichotomum* are both shrubs, the former with white, the latter with variegated flowers.

Clery, Sir Cornelius Francis (1838-1926), Eng. soldier. He saw active service in the Zulu war of 1879, where he was chief staff officer of the 'Flying Column.' He was present at the battles of Isandhlwana and Ulundi, when he was mentioned twice in dispatches. He fought in the battles of El Teb and Tamal, and was again mentioned in dispatches. He served in the Nile expedition in 1885 for the relief of Gordon, and during the years 1886-88 was chief of the staff of the army of occupation in Egypt. He commanded the 2nd Div. in the S. African war of 1899-1902, being again mentioned in dispatches. K.C.M.G., 1900.

Cléry-Saint-André, tn. in the dept. of Loiret, near Orleans. Near it is a tumulus, called by the peasants the tomb of Attila. Pop. 1800.

Clésinger, Jean Baptiste Auguste (1814-1883), Fr. sculptor, intimately connected with the story of George Sand and Chopin. George Sand's daughter Solange, who inherited her mother's passionate nature without any of her genius, eloped

with C. after sitting to him for her bust. The mother effected a private marriage, estab. the young people in Paris, and settled a large share of her property upon them. But C. proved himself an ungrateful rogue, and George Sand was obliged to disown him and her daughter. C. was nevertheless one of the leading sculptors of his day, and executed noteworthy portraits of George Sand and Chopin. Among his works, many of which were objected to on the ground of their immodesty, are allegorical representations of Tragedy and Literature and a marble statue of Louise de Savoy.

Clevedon, par. and attractive watering-place, 1 m. from the Severn and 16 m. S.W. of Bristol, in the N. div. of Somerset, England. Interesting for its associations, for here lived Coleridge and his bride at Myrtle Cottage (1795), and in the par. church lie Henry Hallam, the historian (d. 1859), and his poet son, Arthur (d. 1833), to whose memory *In Memoriam* was written, whilst the original of Thackeray's Castlewood in *Esmond* is C. Court. Pop. 9400.

Cleveland, one of the largest industrial cities of the U.S.A. in Ohio, and cap. of Cuyahoga co., is situated on the S. shores of Lake Erie, which is here connected with the Ohio R. by the Ohio Canal, 183 m. S.W. of Buffalo and 98 m. E. of Toledo; it is the terminus of seven railways, whilst two run through it from E. to W. The two divs. of C., on either side of the R. Cuyahoga, are united by two great viaducts. The first, built in 1873, is of stone, and spans the riv. at a height of 60 ft., whilst the second, of iron, which was erected in 1888, is 3931 ft. long, and rises 100 ft. above the valley's base. Numerous bridges cross the riv. harbour, whilst beyond the mouth a breakwater, 2 m. long, encloses an excellent outer roadstead. During 1890-1900 the tonnage of ships constructed in C. exceeded that of the vessels built in any other Amer. tn. A great deal of the traffic passes over the lake. But though C. is an important centre for corn and lumber, and is, moreover, the largest market for fresh fish in the U.S.A., the wealth of the city depends on its manufs., and above all on its flourishing iron industry. Thus engines, steel and iron vessels, automobiles, boilers, steel rails, and bridges are constructed at the various works, besides nails, agric. implements, and screws. The reason of this is that the city is centrally situated for obtaining the coal from N. Ohio, the iron ores from Lake Superior, and the limestone from the S. of Lake Erie. It has over 3000 manufacturing plants employing 200,000 people, and is the seat of the Standard Oil Company. The Detroit-Superior high-level bridge affords a wide view of lake and riv., harbour and breakwater, iron and steel, lumber and coal, steam and sailing vessels, freighters and liners, blast furnaces and foundries, flour mills and grain elevators, and on the banks above the valley the vast manufacturing plants which furnish employment for more than half of its citizen workers. Rising from a plain from 50 to 140 ft.

above the lake, C., or the Forest City as it is called, from the abundance of its shady elms and maples, presents an imposing appearance, with its fine public buildings—including a free municipal library of 200,000 vols.—its large squares and stately mansions, its famous Euclid Avenue with winding walks and flower-bordered driveways, its univ., technical high school, public auditorium seating 12,000 people, and municipal airport, one of the largest in the world. Founded in 1796 by Moses Cleveland, it has doubled its pop. in twenty years and quadrupled its commerce, and is now the sixth city in the U.S.A. Pop. 878,300.

Cleveland, city in Tennessee, with iron and textile industries. Pop. 4300.

Cleveland (cliff-land), par. div. in the E. of the N. Riding of Yorkshire, extending from Whitley to the R. Tees. It received its name from the cliffs which form the N.E. borders of the Yorkshire moors. It is a dist. of wild highlands, interspersed with a few cultivated and pleasant valleys. Since the discovery of the rich beds of iron ore in its hills (see CLEVELAND IRONSTONE) C. has grown into a great industrial centre, with Middlesbrough as its chief tn., supplying Great Britain with one-third of its pig-iron. The pop. is not returned separately.

Cleveland Bay Breed, see under HORSE.

Cleveland Ironstone is mined in the Middle Lias of C., which is situated in the N. Riding of Yorkshire, between the Tees and Whitley. Certain geologists believe that this dark green clay ironstone, which is not so valuable as that of the coal measures, was 'derived partly from mechanical deposition and partly from subsequent chemical replacement of the originally deposited carbonate of lime.' The theory that once the bed was limestone is supported by the discovery of shells such as *Pecten* and *Avicula*. Only 60 per cent of the ore is carbonate of iron, the rest being composed of phosphates, silica, and argillaceous matter. It is found in seams 20 ft. thick, and is worked on the bord-and-pillar system, Middlesbrough being the centre. Its discovery, which dates from 1851, has revolutionised sleepy hamlets into industrial tns.

Cleveland, Barbara Villiers, Duchess of (1641-1704), mistress of Charles II. of England, daughter of Wm. Villiers, second Viscount Grandison. In 1659 she married Roger Palmer, who became earl of Castlemaine two years later. She became intimate with Charles II. about this time, and was created duchess of C. in 1670. Her sons by the king became dukes of C. Grafton, and Northumberland. D. at Chiswick, Oct. 9.

Cleveland, John (1613-58), Eng. satirist, who, during the Commonwealth, was one of many Royalist fugitives condemned to a life of wandering and abject poverty. In the ingenuity of his conceits he surpasses the so-called metaphysical poets. Though his vigorous satire, such as appears in his poems, *The Rebel Scot*, *Smectymnus*, and *Rupertismus*, may not long have survived the passions which called it forth, it won a contemporary

fame far greater than that of *Paradise Lost*.

Cleveland, Stephen Grover (1837-1908), twenty-second and twenty-fourth President of the U.S.A., *b.* at Caldwell, New Jersey, U.S.A., March 18. He was descended from Moses C. of England, who settled near Woburn, Massachusetts, in 1835. His father was the son of a watchmaker and was pastor of the Presbyterian church at Caldwell. When he was sixteen, his father *d.*, and the son left school to become a clerk in a store in Clinton, New York. For a time he taught at school, and then studied law, being admitted to the Bar at Buffalo in 1859. He entered politics as a Democrat, and his rise was rapid. In 1863 he became assistant dist. attorney for Erie co., in which Buffalo is situated. He was elected sheriff in 1870, and in 1881 he became mayor, being noted for his reforms. This attracted the attention of the state leaders, who brought about his nomination for governor, and he was elected to that office in 1882 by the hitherto unparalleled majority of 192,000 votes. He was nominated for the presidency in 1884, and was elected after an exceedingly bitter campaign, in which his Republican opponent was James G. Blaine (*q.v.*). C. entered the White House as the first bachelor the country had seen there in many years, but, later, married the lovely Miss Frances Folsom, daughter of a former law partner of the President and the ward of C., who became one of the most popular mistresses the White House had ever known. C. resisted the old system of 'to the victor belong the spoils,' by steadily advocating that an increasing number of governmental employees and officials should be placed in the civil service and, therefore, not removable except for cause. In 1887 in a message to Congress he pleaded for the admission to the country of raw materials needed in manufacturing, free from duty. This was his famous battle cry of 'Tariff for revenue only.' He was renominated by the Democrats for the presidency in 1888, and, much to the country's surprise, was defeated by Benjamin Harrison, the Republican candidate. In 1892 the Democrats nominated the once-victorious and the once-defeated C. for the presidency again, and he was triumphantly elected. The storm clouds soon gathered around him. In the first place he fought Republican tariff schemes. Then, against the wishes of many of his own party he forced Congress to repeal the Sherman Silver Purchasing Act, thereby safeguarding the gold standard. In 1895 his strong advocacy of the Monroe doctrine in a dispute between Great Britain and Venezuela over the boundaries between the latter country and Brit. Guiana almost involved the U.S.A. in a war with England. Feeling was tense in both nations, but the situation was saved by the statesmanship of Lord Salisbury, who was then Brit. Prime Minister. Before he left the White House, C. saw his gold-standard policy repudiated by his party, which had nominated to succeed him W. J. Bryan

(*q.v.*), who ran on a free silver platform. C. retired into private life without honour in his own party and settled quietly at Princeton, New Jersey. Before he *d.* there occurred a revolution in public feeling, and it was generally realised that C. would be numbered among the greatest and most courageous of the line of Amer. Presidents.

Cleves (Ger. *Cleve* or *Kleve*): 1. Former duchy of Rhinish Prussia, united with Brandenburg in 1666. 2. Tn. of Rhineland, Germany; formerly cap. of duchy of same name, near the Rhine and the Netherlands frontier, 23 m. N.W. of Wesel. Its chief manufs. before the Second World War were linens, cottons, silks, woollens, and tobacco. The tn. was extensively damaged in the Second World War, and its anc. churches and Schwanenburg Castle were partly demolished or destroyed. Pop. 20,000.

Clew Bay, inlet on the W. coast of co. Mayo, Ireland. From the Atlantic it passes inland for 15 m., with an almost uniform breadth of 8½ m. Clare Is. faces its entrance, whilst the upper portion is dotted with an archipelago of some 300 fertile islets.

Clewer, vil. of Berkshire, England, on the R. Thames, 1 m. W. of Windsor. Here are the headquarters of an Anglican sisterhood. C. comprises two pars., C. Within and C. Without.

Clews, two, bottom corners of a square sail. In a fore-and-aft sail the aftmost corner is termed a clew, the other, or weather clew, being more generally called the tack.

Clianthus, genus of Leguminosæ cultivated in greenhouses on account of their showy flowers. *C. puniceus*, the parrot's beak, can be grown in the open air in Britain if carefully protected.

Cliché, Fr. term denoting the stamp of a die on any soft metal. By the impression made the die-sinker judges the effect of his work. The term is also used for any process (printing) block. From the connotation of repetitive reproduction, the word is employed for a trite or hackneyed phrase, or literary tag.

Clichy, or **Clichy-la-Garenne**, suburb N.W. of Paris, on the r. b. of the Seine, in the dept. of Seine, N. France. Its industries comprise the manufs. of chemicals, starch, soap, oil, and rubber. Merovingian kings lived at C. (anc. Clippiacum). Pop. 53,000.

Click-beetles, or *Elateridae*, form a family of coleopterous insects, most of which have the useful characteristic of being able to right themselves when fallen on their backs; this they accomplish by springing into the air by means of special processes in the back, and the movement is accompanied by a loud clicking sound. They are also called skip-jacks when possessed of this habit. The larvae are often known as wire-worms, and are very destructive; their home is usually underground, and their food the roots of crops.

Client, supposed by some writers to be derived from Lat. *cluer*, to hear. From the very beginnings of anc. Rome there appears to have existed the relation of

patronage (*patronatus*) and clientship (*clientela*). When a man manumitted (analogous to emancipated) a slave, he became the *patronus* instead of the *dominus* of the slave, who was thenceforth a freed man (*libertus*). The tutelage of the *patronus* entitled him to a specific share in the freedman's estate after death. This relationship at Rome fostered the formation of similar relationships between foreigners and Rom. citizens, the result being that the foreigner obtained a protector and the Rom. an accession of influence from occasionally becoming the patron of a man of letters. The poet Terence, for example, was a *libertus*, being manumitted by P. Terentius Lucarius, a Rom. senator. The Rom. C. was defended in lawsuits by his patron; hence the adoption of the term in modern legal practice.

Cliffden, mkt. tn. and port, 29 m. S.W. of Westport, in co. Galway, Eire. It is connected by rail with Galway. Pop. 800.

Cliff Dwellings, certain remarkable ruins of houses, built in horizontal recesses down precipitous cliffs in W. Colorado, Arizona, Utah, and New Mexico. The traveller, as he sees the remains of what must once have been a well-constructed dwelling of lime and stone, with windows and doors both rectangular in frame, is struck above all by its extreme solitude and inaccessibility. Its former inhab. must surely have been in hiding from his foes, for his home was built in a hollow, with beehiving crags overhead, so that it was quite invisible from the cliff summit. In one such ruin the footholes carved in the rock-face may still be seen, but it seems certain that the ascent from the valley below was usually made by ladders or ropes, which could be carried up after use. For the most part these perilous homes are found dotted here and there along the great canyons or gorges, but in the Rio de Chelly there is a cluster of them large enough to be called a tn. There is one in Colorado above the R. Mancos, which looks down from a giddy height of 800 ft., but the most renowned in that country is the great cliff dwelling known as the palace of Chaplin's Mesa. These dwellings, which rose sometimes to two or even three storeys, so strongly resemble the pueblos of the Indians hard by that most archaeologists are agreed in referring their construction to the immediate forerunners of the Pueblo tribes. Another type of dwelling found in this region is in caves formed by volcanic action in the side of canyons. The honeycomb of openings formed similarly on the face of the cliffs provided windows for the Indian dwellers.

Clifford, name of a family descended from Richard Fitzponce. His son Walter, who adopted the name C. on acquiring by marriage C. Castle on the Wye, near Hereford, was the father of the ill-fated Fair Rosamond, whom Henry II. frankly declared to be his mistress. On her death in 1176 she was buried in Godstow nunnery, there being small foundation for the sinister legend that she was murdered

by Queen Eleanor. The soldier-judge, Roger, who won honour at the battle of Evesham (1065), was a great-grandson of Walter. Other of his descendants were John (1435-61) 'the savage Lancastrian'; Henry (1493-1542), fifteenth Lord C. and first earl of Cumberland; and another Henry (1591-1643), the fifth and last earl.

Clifford, Sir Hugh Charles (1886-1941), colonial governor; b. in London, eldest son of Maj.-Gen. the Hon. Sir H. H. C., V.C., C.B. In 1883 he became a cadet in the Malay States civil service. In Pahang he became Brit. resident (1896-99 and 1901). In later years he was associated first with Trinidad and Tobago (1903-7), and then with Ceylon (1907 and 1909), always as colonial secretary. Governor of the Gold Coast, 1912-19; of Nigeria, 1919-25. As governor of the Gold Coast was responsible for Brit. sphere of occupation in Togoland, 1914-19. Governor of Ceylon, 1924-27; then governor of Straits Settlements until 1929. G.C.M.G., 1921; and G.B.E., 1925. He married Mrs. Henry de la Pasture, the novelist and playwright who d. 1945. A constant contributor to the *Cornhill*, etc., was joint editor of a Malay language dictionary, and also pub. *In a Corner of Asia* (1899); *A Free Lance of To-day* (1903, revised ed. 1928); *Further India* (1904); *The Downfall of the Gods* (1911); *Malayan Monochromes* (1913); *The Further Side of Silence* (1916); *The German Colonies* (1918); *The Gold Coast Regiment in the East African Campaign* (1920); *In Days that are Dead* (1926); *Some Reflections on the Ceylon Land Question* (1927); *Bush-Whacking, and other Asiatic Tales and Memories* (1929).

Clifford, John (1836-1923), Baptist minister, was b. in poverty at Sawley, Derbyshire; eldest child of Samuel C. Chartist and Calvinist. As a child he worked in a lace factory. Some Baptists became interested in him, and started him in education at the Baptist College, Nottingham. He received a call to Praed Street Chapel, Paddington, in 1858, and while in that ministry he attended Univ. College. He took B.A. degree, Lond., in 1861; B.Sc. in 1862, with honours in logic, moral philosophy, geology, and paleontology. In 1864 he became M.A. (coming out first); in 1866, LL.B. The Geological Society made him a fellow in 1879. In 1883 he was made honorary D.D. of Bates College, Maine, U.S.A.; thereafter he was known as Doctor C. His ministry had been transferred to Westbourne Park when the chapel there opened in 1877; he was its minister till 1915, when he released himself for more general activity. In 1897 he made a tour round the world. He was president of the London Baptist Association, 1879; the Baptist Union, 1888 and 1899; the National Council of Evangelical Free Churches, 1898-99; the Brit. Chautauqua, 1899-1900; Baptist World Alliance, 1905 and 1911; and Baptist European Congress, 1913. He was an ardent and pugnacious Liberal; and many of his printed works (about a hundred titles) concern social problems.

They include *Is Life Worth Living?* (1880); *Inspiration and Authority of the Bible* (1892); *The Secret of Jesus* (1904); *The Ultimate Problems of Christianity* (1906); *State Education after the War* (1916); *The League of Free Nations* (1919); and *The World Brotherhood according to Jesus* (1920). He ed. the *General Baptist Magazine* (1870-83). He d. suddenly, after addressing a meeting, at Southampton Row, Bloomsbury, Nov. 20, 1923.

Clifford, Rosamond, see FAIR ROSAMOND.

Clifford, William Kingdon (1845-79), mathematician. His many able lectures before the Brit. Association and at the Royal Institution were exceedingly popular. Besides his *Essays and Lectures* (1879), which reveal his philosophy, he wrote many mathematical treatises.

Clifford's Inn, once the tn. house of the barons Clifford, was left to students of law. It became an inn of Chancery and, like Clement's Inn (q.v.), was subsequently absorbed by the Inner Temple.

Clifton, suburb and residential dist. of



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CLIFTON SUSPENSION BRIDGE AND THE RIVER AVON

Clifford, Sophia Lucy, Mrs. William Kingdon, novelist and playwright, daughter of John Lane, a well-known Barbadian. She married in 1875 the mathematician Wm. Kingdon C. (q.v.). Her most popular novel is *Aunt Anne* (1893), in which she describes with sympathy and insight the sordid tragedy of an old lady's life. Her plays include *Hamilton's Second Marriage*, *A Supreme Moment* (1900); *The Searchlight* (1903), and *The Latch* (1908). Her latest books were *The House in Marylebone* (1917); *Mr. Webster and Others* (1918); *Miss Fingal* (1919). She d. in 1919.

Clifford, Thomas (1630-73), b. in Devonshire, was one of the members who formed the 'Cabal', being instrumental in arranging the treaty of Dover, 1670. In accordance with his professed views, he supported the Declaration of Indulgence issued by Charles II., and on the bringing in of the Test Act resigned from public life.

Bristol in Gloucestershire, England. The fine gorge of the Avon, spanned by Brunel's famous suspension bridge, cuts through the plateau on which the tn. is built. The bridge, which took from 1832 to 1864 to build, has a span of 702 ft., and is 245 ft. above high-tide level. The celebrated thermal springs are at the foot of St. Vincent's Rock. Pop. included in Bristol.

Clifton College, public school for boys, was founded in 1862. It consists of a preparatory and junior school and an upper school, the latter having classical, modern, and engineering depts., preparing boys for the univ., the army, or commercial life. There are sev. scholarships also open to the boys.

Climacteric Years (Gk. κλιμακτήρ, round of a ladder) were supposed to be certain years in a man's life which specially affected him as regards health and general circumstances of life. These years were those made up by the odd multiples of 7,

as 49, and the grand C. was reached at 63, when 9 and 7, the two mystical figures, were multiplied. As applied to a woman, it refers to the period known as the change of life, occurring usually between the ages of 45 and 50.

Climate (from Gk. *klimē*, to slope) means the average succession of atmospheric conditions for a long period of time, as opposed to weather, which is used of a single occurrence in the series of climatic conditions. The C. of a locality is thus its average weather. Wind, humidity, and temp. are the chief elements of C. As regards humidity, account must be taken of average ann. rainfall; the variations from season to season and year to year in rainfall; the proportions of precipitation which falls as rain and snow respectively; cloudiness, and relative and absolute humidity. As regards temp., it is important to notice the average ann. and seasonal temps., the extremes of temp. during a season and the temp. of exceptional seasons. There is a distinction between absolute temp. as measured by the thermometer, and sensible temp.—that is, the temp. as it appears. For example, air of a given temp. seems warmer at rest than in motion, and if the temp. is high, dry air seems colder than moist, and with a low temp. it is the other way round. A C. is said to be uniform when the winds are fairly constant in force and direction; when the range of temp. is small, and the distribution of rainfall fairly equal: otherwise it is variable. Thus at Duluth the average range of temp. from one year to another was as much as 120° and at Chicago 108° (for the same thirty years). Some places on the borders of the equatorial calms have their wet and dry seasons quite distinct. Where the monsoons blow, the winds regularly change from one season to another. Cs. are further classified according to parallel climatic zones, which have reference to the amount of heat received from the sun, and therefore represent what is called solar climate; or into oceanic and continental Cs., where the former refers to the effect of water, the latter of land upon C. The three climatic zones are the torrid or tropical, the temperate or intermediate, and the frigid or polar. Their limits are variously defined according to lat., winds, and temp. The latitudinal limits for the zones are as follows: 23½° N. to 23½° S. for tropical; 90° N. to 66½° N. and 90° S. to 66½° S. for the Arctic and Antarctic polar zones respectively, and 23° to 66½° (N. and S.) for the two intermediate zones. The zones can only be vaguely defined according to winds. Thus the trade-wind zone often overlaps the torrid zone to 30° or even 35° N. and S. Prevailing westerly winds and a variable C. characterise the intermediate zones which stretch polewards from the zone of the trade winds. If temp. be the standard of div., the isotherms are the boundaries of the various zones. A satisfactory div. is obtained if the intermediate zones are bounded on the equator side by the ann. isotherms of 68° and on the polar by the isotherm of 50°

for the warmest month. The C. of every zone may be subdivided into oceanic and continental. The following is a statement of the main differences between these subdivisions in oceanic Cs.: (1) The ann. range of temp. is much less. In Madeira (an Is.) it is only 13°, whilst at Bagdad (in Asia Minor) it is 40° F. Both places lie in a low lat. (2) The 'annual march' of temp. is much more retarded by the sea. Thus over the ocean the springs are colder, the autumns warmer. (3) The humidity is greater. This results in more cloudiness and a higher rainfall. (4) The winds are, generally speaking, stronger. The leeward shores of the oceans, the W. coasts in the temperate zones, and the E. coasts in the trade-wind zones, have oceanic Cs. Under marine Cs. crops of wheat and potatoes, etc., are less nutritious owing to the excess of moisture, etc. Continental Cs. include desert, littoral or coastal, and mt. and plateau Cs. In the desert C. the daily variability of temp. is considerable, the nights being much cooler than the days. In the daytime the winds blow strong and carry great dust clouds. Rocks crack because of the violent changes in temp., and in consequence of the extreme dryness plants and animals cannot live. Mt. and plateau Cs. have greater insolation (warmth from the sun) and radiation because of the increased elevation, a lower absolute humidity, a lower temp., and a greater precipitation or rainfall. Highlands give rise to local winds and interfere with the horizontal passage of the atmosphere, so that on the two sides of a range the pressure and humidity may be quite different. Continental Cs. are influenced by forests. For by increasing the surfaces exposed to radiation and evaporation they lower the summer temps.: they also afford shelter from winds, and by retarding the permeation of rain and the melting of snow increase the relative moisture of the air.

Climatic Characteristics of the Various Zones.—In the Tropical Zone: The prevailing wind is easterly, N.-easterly above the equator, S.-easterly below. Usually the trade winds are dry: the Sahara and desert regions of Australia lie in their path. But in their passage over hills and plateaux they yield moisture, so that the tableland of Brazil and the E. slopes of the Andes have plentiful rain. The monsoon rains which fall when the monsoons blow from sea to land during the warm season, fall on regions that would otherwise be dry. In the 'doldrums'—a belt of calm between the two trade winds—convection currents lift up abundant moisture, which is precipitated after condensation as the daily afternoon rains. On the Sahara the extremes of temp. are great, 120° and 50° F., although the average ann. variation is slight. But high temp. is the chief distinction of this zone. In the Intermediate Zones: The average temp. is lower, the ann. range greater, and the daily range less, than in the tropical zone. The inequality of day and night and the considerable range in the angle of the sun's rays, and therefore of their heating power, account for the greater seasonal variability of

temp. In lat. 45° there are at the summer solstice 15½ hrs. of sunshine (and heating); at the winter solstice there are only 8½ hrs., the remaining hours being given over to night (and cooling). Moreover, in the same lat. the summer may be very hot, the winter very cold; for when the days are longest the sun's rays are almost vertical, and the heat per hour, therefore, is greatest. The winter's cold also has the effect of retarding the spring, and summer's heat of lengthening the autumn. For in spring the oblique sun's rays take a long time to melt all the snows and ice, and until this is done the air above cannot grow warm: in the autumn, on the contrary, the ground continually warms the atmosphere by giving up its stores of summer heat. The climates of the N. and S. intermediate zones differ in that the former, owing to the greater extent of earth, is on the whole continental, the latter oceanic. Thus the cool summers of the S. zone are unfavourable to agriculture. The winds for the most part are westerly. They are dry when they pass from the sea to warmer lands (for they take up moisture), and wet when the regions over which they blow have a cooler temp. than their own. Cyclones and anticyclones furnish the greatest ann. extremes both of heat (during cyclones) and of cold (during anticyclones). They also give moisture to the middle lats. The greatest ann. variability of temp. in the world is found in parts of Siberia remotest from the sea. Continental climates are prevalent on the E. borders of the continents, oceanic on the W. But the contrast is greater between opposite sides of the Atlantic (compare England and Kamchatka) than between opposite sides of the Pacific (compare Labrador and Vancouver). This is due to the warming power of the Gulf Stream and to the icy water which passes from the Arctic into the open Atlantic down the E. coast of America. In the Polar Zones: The unequal distribution of heat is very great. And at the poles the year is divided into two periods of perpetual day and perpetual night. Whilst snow is still on the ground the temp. of the surface, even in summer, cannot be raised above 32°, but where land is free of snow the range of temp. is great. The amount of rainfall necessary for agriculture depends on the temp. of the regions, the distribution of precipitation throughout the year (much rain is needed whilst the crops are growing), and the nature of the crops. In S. Australia 10 in. of rain support 9 sheep per sq. m.; in New S. Wales 14 in. support 96, and 20 in. 640 sheep per sq. m. A 34-in. rainfall in the Argentine will maintain 2630 sheep per sq. m. In prehistoric times, changes in C. have been brought about by atmospheric, astronomic (relating to changes in the earth's orbit), and geographic (relating to changes in the topography of land and its relation to water) causes. The petrified forests of Arizona prove that it once had a humid C. whilst gypsum deposits show that New York was once arid. At one time Greenland was warm enough to grow magnolias, and

glaciers were very much more widely distributed. See H. W. Dickson, *Climate and Weather*, 1928; A. A. Miller, *Climatology*, 1931; W. C. Kendrew, *The Climate of the Continents*, 1937; S. F. Markham, *Climate and the Energy of Nations*, 1942.

Climax (from Gk. *κλίμαξ*, a ladder), figure of speech much used in rhetoric. A series of words, phrases, or sentences, expressive of facts or ideas, is so arranged that the mind of the listener is led gradually, as by ladder rungs, from what is of least to what is of crowning importance. The impressiveness of Macaulay's style depends not a little on his appreciation of the effectiveness of this figure.

Climbers, popular form of the old term *Scansores*, which was applied to birds of a climbing habit, many of which were characterised by having two toes turned backwards and two forwards. Examples of this obsolete order are woodpeckers, parrots, cuckoos, and cockatoos.

Climbing, Mountain, see MOUNTAIN-CLIMBER; ROCK-CLIMBING.

Climbing Plants. There are at least six different methods of climbing adopted by plants; each is distinct in itself, although perhaps the casual observer would have some difficulty in enumerating them: (1) By means of the main stem which twines round the support; this occurs in hop, dodder, etc., the usual direction is anti-clockwise but the hop always twists clockwise; (2) by tendrils, as in passion flower, sweet pea, etc.; (3) by means of spines and prickles, as in rose and all brambles; (4) by aerial roots as in ivy; (5) by the petioles or leaf-stalks: this method is found in the garden nasturtium (*Tropaeolum*), clematis, and *Solanum jasminoides*; and (6) by the stipules of the leaf, which are modified as tendrils, as in *Smilax*. C. P. are commonly cultivated for decorative and useful purposes; they can easily be grown to hide bare walls, to cover trellis-work, to make a shelter from the sun, etc. Some are hardy, and both annuals and perennials are easily raised from seed out of doors, e.g. canary creeper. Others which are half-hardy must be raised under glass, and not put out in the open ground till mild weather is ensured. The majority of outdoor C. P. are deciduous, shedding their leaves once a year, but a few are evergreens, such as the ivy.

Clincher, see CLINKER.

Clinic, institution in which treatment is given to visiting patients, and where instruction is frequently given to medical students by the examination of patients. (The expression clinical medicine (Gk. *κλινική*, bed) denotes that method which deals with the treatment of a disease at the bedside of the patient and with lectures delivered there also.) The name C. may be applied to out-patient depts. of hospitals, bor. health centres, medical schools, or that part of any public institution where examination and treatment are carried out for the benefit of both patient and student.

Clinical Thermometer, see under THERMOMETER AND THERMOMETRY.

Clinker, or *Clincher*: 1. Term used in small boat construction, to indicate that

the planking of the hull is laid with overlapping edges and not edge to edge as in carvel. 2. Incombustible residue left in coal and coke-fired furnaces. In the furnace it tends to collect in masses and would adhere to the fire-bars if not removed from time to time. When cold it hardens and is usually employed in concrete-mixing and in road-making.

Clinograph, draughtsman's instrument for drawing a number of similar triangles in succession. It resembles the carpenter's bevel in principle, but its stock and blade are of the same thickness. It is very useful in graphic calculations in statics.

Clinometer, instrument used by surveyors, geologists, etc., for measuring the dip or angle of inclination of surfaces. In its simplest form it consists of a graduated arc and a plummet. When the instrument is held level the plummet points to zero, but when it is held at an inclination it shows the number of degrees by which the upper surface of the C. differs from the horizontal. The most useful form of C., however, is that which is combined with a pocket compass, as it is generally necessary to know the direction of the slope as well as its amount.

Clinton: 1. Co. seat of C. co., Iowa. It stands on the Mississippi R. at a point where it is crossed by a railway bridge 4000 ft. long, and has important industries, with many beautiful old houses. Pop. 26,200. 2. Cap. of Henry co., Missouri, U.S.A., on the Grand It., with large flour-mills. Pop. 6000. 3. Tn. in co. Worcester, Massachusetts, on the R. Nashua, with extensive manufs. Pop. 12,400. 4. Co. seat of De Witt co., Illinois, U.S.A., with railroad shops and clothing factories. Pop. 6300. 5. City of Indiana on the Wabash R. with various manufs. in a farm and coal-mining region. Pop. 7000. 6. Vil. of Oneida co., New York, 9 m. S. of Utica, the seat of Hamilton College for men, founded in 1793 by Samuel Kirkland (1741-1808), a missionary to the Oneida Indians, President Washington expressing 'a warm interest in the institution.'

Clinton, Amer. family founded by Charles C. (1690-1773). b. in Ireland. He left Ireland for America and estab. himself in Ulster co., New York.

James Clinton (1736-1812) was the son of Charles C., and served in the U.S.A. army. He was the father of De Witt C.

George Clinton (1739-1812), son of Charles C.; in 1775 joined the army, after having sat in the New York Assembly. He held a high place in the army, and in 1777 was appointed governor of New York, becoming finally vice-president of the U.S.A., an office which he held till his death.

Clinton, De Witt (1769-1828), Amer. statesman, began his political career by acting as private secretary to his uncle, George, the leader of the Republican party at New York (1790-95). From 1798 to 1802 he was a member of the U.S. Senate, and three times (1803-7, 1808-1810, and 1811-15) he was mayor of New York City. He was governor of New

York State, 1817-23 and 1825-28. In Congress he identified himself with the movements for abolition of slavery and of imprisonment for debt, and for improvement of the free public schools system. In 1825 he was present at the opening of the canal between the Hudson R. and Lake Erie—an undertaking which had been carried through largely as the result of his persistent efforts.

Clinton, Sir Henry (c. 1738-95), son of Adm. George C. He began service in the militia in New York, but became lieutenant in the Grenadier Guards in England in 1751; and captain and lieutenant-colonel in 1758. He took part in the Seven Years war; also in the battles of Bunker's Hill and Long Is., and in 1778 became commander-in-chief in N. America. Owing to unpopularity, however, he resigned his command. In 1772-84 and 1790 he sat in Parliament, and in 1794 was appointed governor of Gibraltar.

Clinton, Sir Henry (1771-1829), younger son of Gen. Sir Henry C. He served in the Corunna campaign, and distinguished himself in the Peninsula under Wellington, being made lieutenant-general. He was also to the fore at Waterloo.

Clinton Group, name assigned by geologists in New York to the Upper Silurian series of rocks, composed chiefly of argillaceous sandstone.

Clio, first of the nine muses, who presided over hist., and is represented as crowned with laurels, holding a book in one hand, and in the other a trumpet.

Clio, genus of naked marine gastropod or wing-footed molluscs so called because they are constructed for moving through water by means of fin-like membranes which are lateral expansions of the foot. *C. borealis* is a species which abounds in N. seas and constitutes a great portion of the food of the Greenland whale.

Clipper, sailing ship constructed for very rapid sailing. It is longer and narrower than an ordinary sailing vessel. Many of these Cs. which were used frequently in the transport of tea from the E., were built at Aberdeen, but they are not used now. The term has been borrowed for the craft of a U.S. airline which provides service on long sea routes. (See illustration, p. 736.)

Clipperton, Is. in the Pacific Ocean. The Is. is of coral formation, and its highest point rises to more than 150 ft above sea level.

Clippiacum, see **CLICHY**.

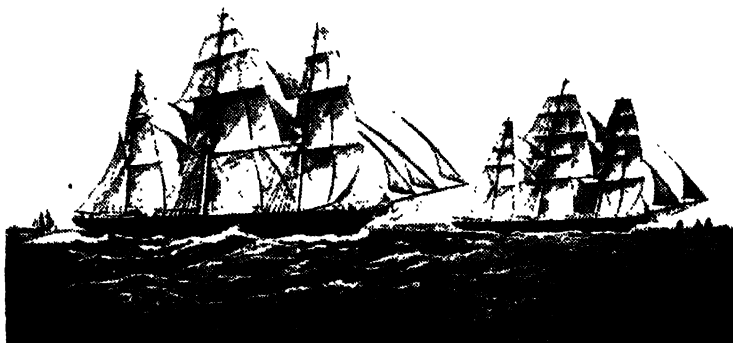
Clissold Park, public park in Stoke Newington, N. London. It was acquired in 1887 at the cost of £96,000, and opened in 1889 by the earl of Rosebery, the first chairman of the London Co. Council. The mansion of the park was formerly the residence of a Mr. Crawshaw, who rented it, with its adjacent grounds, from the Eccles. Commissioners at an annual sum of '£109 and a fat turkey.'

Clisson, tn. in the dept. Loire-Inférieure, France, 17 m. S.E. of Nantes. The tn. and castle, belonging to the celebrated C. family, were destroyed in 1792-83 during the Vendean wars; the former was

rebuilt in the nineteenth century. Pop. 2700.

Clitheroe, mrkt. tn. and municipal bor. on the Ribble, at the foot of Pendle Hill, in the C. parl. div. of Lancashire, England, 35 m. N. by W. from Manchester. C. has paper and cotton mills, breweries, foundries, printing estab., and important lime and cement works in the neighbourhood. Its free grammar school was estab. in 1554, and there are still some remains of an eleventh-century castle, which with the grounds were purchased for the tn. as a memorial of the First World War. Pop. 12,000.

the man. Though dull at books, he was notorious for reckless courage; and there is the tradition, most delightfully prophetic, that as a lad he formed a small army of boys and levied a tax on the shopkeepers of Market Drayton, which they paid lest otherwise their windows should be broken. In his eighteenth year he received the offer of a writership in the Honourable E. India Company's service at Madras, an opening which, needless to say, was as welcome to him as to his parents. He scented adventure in the E., adventure that was to come surely enough, though not quite so soon as



'Picture Post' Library

THE CLIPPERS 'ARIEL' AND 'TEAPING,' 1866

A contemporary print of the meeting of the two vessels off the downs after a voyage of ninety-nine days from Foochow.

Clitus, or Cleitus, surnamed *Μελας*, 'The Black,' was the brother of Alexander's nurse, Helleniké. C. was made one of Alexander's lieutenants, and saved the latter's life at the battle of Granicus in 334 B.C. He was made satrap of Bactriana in place of Artabazus in 328. At a banquet, when Alexander was present, he dared to criticise the luxury of the latter's court, and to extol the virtues of Philip. Alexander, who was drunk, killed C. on the spot, and was afterwards overcome by remorse.

Clive, Caroline (1801-73), authoress, was the daughter of Edmund Meysey-Wigley, and was b. in London. In 1840 she married the Rev. Archer C. She wrote sev. sets of poems, signed 'V.,' but her best book is a novel, *Paul Ferrol* (1841).

Clive, Robert Clive, Baron (1725-74), Indian administrator, came of an old Shropshire family. Many stories are told of his schooldays, which go far to prove that in this case the boy was father of

he expected. The outward voyage was unduly protracted, and he did not arrive at his destination until late in 1744. The long delay had swallowed up the contents of a meagre purse, and he reached Madras in debt. In that city he knew no one, and was far too shy to take advantage of such opportunities to make acquaintance as did occur. Loneliness and the slenderness of his resources made him so miserable that after a few months' sojourn in India he decided to commit suicide, and he desisted only when he had pointed a pistol at his head and twice pulled the trigger without obtaining the desired result. He then examined the weapon, and finding that it was properly loaded, he put it aside, remarking that it was evident from this intervention of providence that he was intended for something great. Fate did not keep him waiting long. In 1746 Labourdonnais captured Madras, and among many took C. prisoner. The young man escaped, however, to

Fort St. David. He now desired to abandon the civil and enter the military side of the company's service, and he applied for, and in 1747 obtained, an ensign's commission. Though he had had no previous training in arms, he showed signs of military genius, and elicited the commendation of Maj. Lawrence. A treaty of peace between England and France was signed at Aix-la-Chapelle in Oct. 1748, and C. returned to his former occupation. He was not destined long to remain at his desk. He was given a command, again under Maj. Lawrence, in the expedition against the rajah of Tanjore, during which he showed the same bravery that he had previously displayed in the unsuccessful siege of Pondicherry. After the conclusion of this campaign he was appointed commissariat officer to the Brit. troops, and shortly after was promoted captain. He submitted in 1751 a plan for the capture of Arcot, the cap. of the Carnatic, and was, to his great delight, permitted to endeavour to carry it out. He occupied the tn., and held it for two months, with his 500 men, of whom only 200 were Eng., against an army of 10,000. At the end of that period the enemy retired. The defence of Arcot, Malletson, the military historian, has said, may be regarded as 'the turning-point in the career of the English.' Though not at the time regarded as so important as, in the light of subsequent events, it is now, C.'s defence made a great reputation for him, which was enhanced by his later achievement in the campaign. C. was in 1753 invalided home, and was welcomed by the court of directors of the E. India Company, who, as a token of the high esteem in which they held him, presented him with a very valuable sword mounted in diamonds, which, very properly and modestly, he declined to receive unless a similar mark of honour was bestowed upon Maj. Lawrence. He returned to India in 1756, and, after serving for a short time in Bombay, went to Madras, where the news came that Suraj-ud-Dowlah had captured Calcutta and imprisoned the Eng. captives in the Black Hole (q.v.). C. went forth to retake Calcutta and to avenge the victims of the outrage. He defeated Suraj-ud-Dowlah at Plassey (June 23, 1757), and dethroned him in favour of Jafar Ali. From 1757 C. was governor of Bengal until 1760, when he returned to England, where he was received as a popular hero by every one, from the king to the mob. He was elected member of Parliament for Shrewsbury, and in 1762 was created Baron C. in the Irish peerage. Two years later he went out as governor of Bengal to put the administration on a sound footing. This he did, but in 1766 he had to return owing to ill health. In England he was attacked for having abused his position, and many charges were brought against him. A parl. inquiry was held, and the House of Commons unanimously accepted a resolution that he had rendered 'great and meritorious services to the State.' He d. by his own hand, after long suffering severe bodily agony, on Nov. 22, 1774, at

the age of forty-nine. C. no doubt often acted in a way that in a twentieth-century official would be regarded as little less than criminal: thus he accepted vast sums from native princes, but that was the custom of his day, when the Englishman in India was not as a rule, and was not expected to be, very scrupulous as to the manner in which he acquired a fortune. On the other hand, he was a just administrator, a great ruler, and a brilliant soldier; and he it was who securely laid the foundation of the Brit. Empire in



ROBERT CLIVE

India. See Sir J. Malcolm, *The Life of Robert, Lord Clive*, 1836 (reviewed by Macaulay, 1840); C. Wilson, *Clive*, 1890; Sir G. W. Forrest, *Life of Lord Clive*, 1918; R. J. Minney, *Clive*, 1931.

Clive, Catherine (Kitty) (1711-85), actress, daughter of Wm. Rafter, a man of good family. About 1727 she came under the notice of Colley Cibber, manager of Drury Lane, and as she showed decided talent for the stage, a place was found for her in the company, where she played Ismenes, the page in *Mithridates*. Not long after this she married George C., a barrister, but they separated very soon after their marriage. She joined Garrick in 1746 and remained with his company until 1769. She won recognition as a comedy actress by her performance in *The Devil to Pay* (1731). She took part also in some oratorios, possessing a fine, well-trained voice.

Cloaca, in zoology, is the name given to the common chamber in some vertebrates into which open the alimentary canal, the genital and urinary ducts; it is present in all amphibians, birds, and reptiles, in the monotremes and some fishes. In

higher mammals the urinogenital orifice and the anus take the place of the C.

Cloacæ, sewers of ant. Rome. The fact that Pliny called the city 'urbs pensilis' (hanging) shows to what an extent they undermined it. Ruins of many still exist buried underground. The most famous, known as Cloaca Maxima, was built by a Tarquin (sixth century B.C.) to drain the forum which stood on marshy ground between the Palatine and Capitoline hills. It was 14 ft. high and 10½ ft. wide. Under the republic C. were supervised by the censors; under the empire by the *curatores cloacarum*.

Clobbering, in pottery-making, a mode of decoration of Chinese blue and white china with flowers, etc., painted in enamel and fired. Used considerably in the Netherlands from the early eighteenth century and, in England from the same time until the middle nineteenth century.

Clocks. A clock is any mechanism for measuring and indicating time other than a watch or chronometer (*q.v.*). Its essentials are a motive power and its control. In the sand-glass, attraction due to gravity is the motive power, and the hole in the tube the control. In modern C. a spring is the motive power, and this power is subjected to intermittent restraint by a part known as the escapement, which is released by the swing of a pendulum. C. may be broadly classified according to the driving mechanism—weight-driven, spring-driven, or electric, or again, according to their general design or use—*e.g.* alarm C., coach or carriage C., long-case C. regulators, turret C. All long-case C. were formerly weight-driven, but they may now be spring or electrically driven. Astronomical C. are precision C. indicating sidereal time. The perfecting of the electric clock, first invented by Alexander Bain in 1843, is a recent development. In one type electricity is used to wind the clock by means of a simple direct current motor, operated from a battery. In others the clock is a simple synchronous motor running in step with the alternators of the power station which supplies the electricity. The frequency of the current generated is constant, being 50 cycles per sec. and (in the United Kingdom) is constant for all electricity stations. The radium clock is not yet a commercial concern. The action of rays from radium in a vacuum tube containing strips of tinfoil causes the strips to repel each other and then fall back into position at regular intervals, but time-keeping by these means has not yet been devised. Radium, however, is used commercially to illuminate the dials of C. and watches. Clock-making used to be the work of one man, and it is traditionally supposed that the Glastonbury Abbey clock was made by one man in the fourteenth century. By the nineteenth century, however, when Eng. clock- and watch-making were flourishing, the work was divided into about forty branches. At this time the movement or working part of the clock

was roughly made by a manufacturer and then passed on to the clock-maker to be finished by hand. After 1866 some parts were made and polished by machinery, and the Eng. lever watch became very popular. Watch-makers were divided between the fusee type of watch and the going-barrel watch. Eng. manufacturers favoured the former, but owing to this preference they failed to satisfy the growing demand for reliable, inexpensive watches such as were supplied by Swiss and Amer. manufacturers. This distinction has remained until the present day, when the construction of C. and watches is done largely by automatic machinery (*see further* under WATCHES). The Amer. trade has from the first concentrated on the mass-production of C. and the perfecting of them by machinery, but in England manufacturers are mostly concerned with high-grade C. Of cheap C. Germany and the U.S.A. have the largest manuf., and Switzerland and the U.S.A. of cheap watches. The Eng. industry has been aided by an import duty, but in spite of this 3,000,000 complete C., of which two-thirds were from Germany, and 4,000,000 complete watches, were imported into England annually in the period immediately prior to the outbreak of the Second World War, the total average value being £1,200,000. Apart from this there is a considerable trade in parts of C. and watches. The Clockmakers' Company, one of the city livery companies of London, was incorporated in 1631. *See also* HOROLOGY. *See* J. F. Britten, *Old Clocks and Watches and their Makers*, 1904; C. H. Baillie, *Watchmakers and Clockmakers of the World*, 1929; J. Smith, *Old Scottish Clockmakers (1153-1850)*, 1933; S. F. Philpott, *Modern Electric Clocks*, 1945.

Clodd, Edward (1840-1930), b. at Margate. He began his career in the London Joint-Stock Bank, and held the post of secretary to that bank 1872-1915. He was an ardent rationalist. His chief works are *The Childhood of the World* (1873); *The Childhood of Religion* (1875); *Myths and Dreams* (1885); *The Story of Creation: a Plain Account of Evolution* (1888); and *Primitive Man* (1895). He pub. his interesting *Memoirs* in 1916 and his Royal Institution lectures on *Oecultism* in 1922.

Clodius, *see* CLAUDIUS, PUBLIUS.

Clodius, or **Claudius**, Albinus (d. A.D. 197), whose full name was Decimus Clodius Celonius Septimius Albinus, was b. at Adrumetum in Africa. He entered the army at an early age, and served with distinction under Marcus Aurelius, especially during the rebellion of Avidius Cassius, A.D. 175. He was raised to the consulate in 176, and appointed to the governorship of Gaul and afterwards of Britain by the Emperor Commodus. On the death of Commodus and that of his successor, Pertinax, 193, Septimius Severus declared C. Caesar, in order to secure his neutrality, while he himself marched on Rome. Having there defeated his rival Pescennius Niger, he resolved to get rid of C. also. A great

battle was fought at Lugdunum (Lyons), in which Severus was victorious and C. killed.

Cloelia, Rom. maiden sent as a hostage to Porsena. After escaping by swimming the Tiber, she was sent back by the Romans to Porsena, who released her on account of her bravery. She was allowed also to choose other hostages for release, and she chose the youngest. A statue was erected to her in the Via Sacra.

Cloister (Lat. *claustrum*, an enclosure; Fr. *cloître*), quadrilateral space, surrounded by an ambulatory or covered passage, to shelter from rain, etc., attached to monastic buildings and cathedrals, and often also to colleges. The C. was usually built on the S. side of the church, so as to benefit by the sunshine. Canterbury, Chester, and Gloucester have fine examples of Benedictine Cs. In the old days the church would be on one side



THE CLOISTERS OF ST. JOHN LATERAN (SAN GIOVANNI), ROME

Anderson

Clog Almanac, anct. kind of calendar, usually made of wood, though sometimes of metal. It was square in shape, and on it were notched the months and the days with special marks for saints' days. It was supposed to have originated in Denmark.

Clogheen, tn. of Eire in the co. of Tipperary, about 13½ m. W.S.W. of Clonmel. Pop. 700.

Clogher, vil. in the S. of co. Tyrone, Eire, 14 m. S.S.E. of Omagh, on the C. Valley light railway. The Protestant cathedral of St. Macartin dates from the end of the eighteenth century. C. also gives its name to a Rom. Catholic diocese, but the bishop's seat is at Monaghan. Pop. 200.

Clogs, shoes worn by peasant people in sev. countries of the Continent, and also used in the N. of England and parts of Scotland and Wales. The uppers are of leather and the soles are made of wood.

Cloisonnée, see under ENAMELS AND ENAMELLING.

of the ambulatory and the refectory on the side opposite whilst E. and W. were the chapter-house and the larders and cellars. Almost invariably the dormitories would be on the upper storey. On the side skirting the quadrangle, pillars and arches, sometimes decorated with elaborate carving and delicate-patterned traceries, supported the cloistral roof, which was often vaulted. At Gloucester, the exquisite fan-traceried vaulting is still in perfect preservation. Besides walking daily in the Cs. for recreation—from the ambulatory at Mont St. Michel they could see on all sides the great Atlantic—the monks used also to hold schools for novices and to paint, carve, and read theology in the recesses or stalls on the inner side. Here, too, they could talk at certain hours. The square grass plot was sometimes unfortunately shut out from view by glazed windows, as at Westminster Abbey. Among the many beautiful Cs. still in existence may be cited those of St. John

Lateran at Rome, of Monreale in Sicily, and of Campo Santo at Pisa, where the spacious ambulatories are actually four in number.

Clonakilty, seaport and mkt. tn., on O. Bay in S.W. of co. Cork, Eire. It is the terminus of a branch of the Cork, Handon, and S. Coast Railway. Pop. 3000.

Clones, tn. of Eire, in the co. of Monaghan. It possesses the ruins of an old abbey. Pop. 2400.

Clonfer: 1. Par. on the Allow, in the N. of co. Cork, Eire. Pop. 7791. 2. Par. and tn. on the Shannon and the Grand Canal, in the S.E. of co. Galway, Eire. Pop. 1633.

Clonmacnoise, par. of Offaly, Eire, area 21,918 ac. Has ruins of the cathedral and other churches, two round towers, and was the cemetery of Irish kings. Pop. 1899.

Clonmel, municipal bor. and co. tn. of co. Tipperary, Eire, on the Suir, 130 m. S.W. of Dublin by rail. It is still a tourist centre, and is famous also as the bp. of Sterne. Formerly the centre for Bianconi's system of jaunting cars (1815). Besides exporting agric. produce, it has tanneries and flour-mills. Pop. 10,209.

Clontarf, tn. of Eire, situated on the bay of Dublin and in the co. of that name. A battle was fought here in 1014, which ended in the Danes being defeated by the Irish. Pop. 4613.

Clonus, or **Reflexes**, series of spasmodic muscular movements not controlled by volition. The jerks are occasioned by alternate contractions and relaxations of certain muscles and are usually characteristic of an abnormal state of health. Even when nerves are perfectly healthy, clonic spasms may be produced by the sudden stretching of the muscles, and may vary in degree from contractions of considerable force and amplitude to scarcely perceptible tremors. The term C. is particularly associated with rhythmic and involuntary movements of the ankle, jaw, and wrist, and such conditions are known as ankle, jaw, and wrist C. They do not differ in kind, however, from many other movements which are generically termed reflexes. The question of the causation and process of reflex action has received much attention at the hands of physiologists, and the association of different parts of the nervous system with the various reflexes has been well investigated by observation and experiment. Muscular movements may be divided into voluntary and involuntary. Voluntary movements involve a certain degree of consciousness, not only as regards perception of the movements, but also with respect to their origin. The stimulus which evokes a voluntary movement may be a sensation carried to the brain by a peripheral nerve, but the brain process involves a reaction between the new perception and perceptions already existent in consciousness, so that the resulting movement corresponds in only a modified manner with the external stimulus. Involuntary movements, on the other hand, bear a certain definite relation

to the stimuli which evoke them; if the same stimulus be repeated, the same movement will follow, unless other nervous forces interfere to modify or inhibit that movement. It may be said, however, that many movements which are usually reflex may come under the dominion of the will if attention be attracted towards them. Breathing, for instance, is usually reflex, and the muscles associated with that function adapt themselves to any variation required by altered conditions without disturbing consciousness, but if the conditions are particularly unusual, or if the trend of thought leads to the subject of breathing, the muscular movements may be consciously directed. The part of the central nervous system associated with voluntary action is the brain, while reflexes constitute the special function of the spinal cord. A reflex is a reaction which is started by a stimulus acting on some nerve; the stimulus is conveyed by afferent nerves to the spinal cord, whence an impulse starts towards appropriate muscles or glands. The spinal cord therefore functions as an exchange, by which certain stimuli are made effective in near or distant quarters. Many reflexes are very complex and have been highly differentiated in the striving of the organism after economy of effort; the higher the degree of differentiation the greater is the possibility of the reflex being disturbed by cross reflexes or voluntary control. Some reflexes, particularly where nerves are tapped, as it were, on their way to the central system, are peculiarly invariable, at any rate in ordinary health. The absence or modification of such a reflex is therefore often an important indication of a morbid condition otherwise difficult to diagnose. It is in this connection that clonic movements are useful. The occurrence of a reflex when none should be expected argues that certain abnormalities connected with the nervous structure exist, and these abnormalities have gradually been classified in the light of clinical and experimental knowledge. The knee-jerk, for instance, obtained by striking the patellar tendon when the knee is flexed at a right angle, is absent in locomotor ataxia, destructive lesions of the lower part of the spinal cord, diabetes, infantile paralysis, etc. It is increased in tumours of the brain, cerebrospinal sclerosis, after epileptic seizures, etc. Ankle-C. is obtained by sudden flexion of the foot by pressing the hand against the sole. It is rarely manifest in perfect health, and indicates some degree of spinal disturbance. Jaw-C. is also present in health, but is plainly shown if there is sclerosis of the lateral columns of the spinal cord. It is obtained by a firm blow on the lower jaw hanging passively or gently supported by the hand; a series of contractions and relaxations causing jerky movements of the jaw results. Wrist-C. is obtained by pressing the hand backward to extreme extension; it is observable in hemiplegia. There are many other reflexes not of a clonic or rhythmic character which occur or disappear in

certain diseased conditions, particularly those associated with the spinal cord. The specific character of C. as distinguished from other reflexes lies in its rhythmic or periodic quality. Rhythm is, of course, present in such reflexes as breathing, walking, and the beating of the heart, but such processes are fairly complex. Rapid rhythmic movements, such as the scratching of its hide by a dog, can be produced even when voluntary action is rendered impossible by removal of part of the brain. If the skin of the shoulder be irritated the stimulus is conveyed to the spinal cord, and the afferent nerves carry alternate impulses to the flexor and extensor muscles of the hind leg, so that an almost perfect rhythm of about four beats to the second can be produced. It is obvious that in such a movement the contraction of the flexor muscles must be followed by a pause, after which the extensor muscles reverse the movement of the limb. These movements appear to resist fatigue for a long time. Tremulous movements of the limbs seems to argue an irritability of the nerves, causing a rhythmic though feeble contraction and relaxation.

Clouts, or **Cloutz**, Jean Baptiste du Val, de Grâce, Baron von (1755-94), was b. at the Château de Badenthal near Clèves, Rhineland. He was of Prussian nationality, and took a prominent part in the affairs of the Fr. Revolution. After travelling in Europe, he returned to Paris in 1789, on the outbreak of the Fr. Revolution, and joined the Jacobin Club. In the following year, at the bar of the Assembly, he declared his and others' adherence to the Declaration of the Rights of Man. From that time he assumed the appellation 'orator of the human race,' and took the name of 'Anarcharis C.' In 1792 he became a Fr. citizen, and at the same time extended his revolutionary opinions to the denunciation of religion. He was also chosen to be a member of the Convention. He was eventually condemned to death on a false charge by the tribune of the revolution and was guillotined.

Cloquet, city in the co. of Carlton, Minnesota, U.S.A., and stands on the N. Pacific and the Great N. Railway. It is an important centre of the lumbering trade, and it also manufactures paper. Pop. 7000.

Close (Lat. *clausum*, shut), an enclosed space, used in England for the precincts of a cathedral or an abbey. In Scotland and in colloquial Eng. the word is used for a narrow passage leading to a block of tenement houses, to the entrance of a court, or from a main street.

Closed Shop, term, first used in America, to indicate those shops or factories from which non-union labour is excluded at the insistence of trade-union workers. Such action is not of modern growth, because the guildsmen or craftsmen of the late Middle Ages vigorously insisted in England on the exclusion from their work of workers who were not of their crafts or guilds. The Eng. term corresponding to C. S. is union shop, but the former term is now widely used. In the U.S.A. (where there is no political levy) a C. S. is an

industrial estab. in which the employer prescribes, as a condition of employment, that each worker shall belong to his appropriate trade union. Where two trade unions compete for the support of a particular craft, the union which is accepted as 'appropriate' is determined by a somewhat intricate process operated by a Federal Board of Industrial Relations, a gov. body the like of which does not exist in Britain. The position of the employer is that the unions compel him to lay down the condition of union membership, and the board tells him which is the union, in each craft, to which a monopoly has been granted. In effect he acts as honorary treasurer of the monopoly union, deducting its subscriptions from the employees' wages. In Britain, theoretically at least, an employer insists only upon trade-union membership, while leaving the employee free to choose his union. The net effect of the C. S. is, and can only be, to compel men, under pain of industrial outlawry, to associate with a movement which is, at least, quasi-political.

Close-hauled, term applied to the general arrangement of the sails of a ship when she is travelling as near as possible to the direction of the wind. Square-rigged vessels when C. make a small angle with the line of the wind's direction, but cutters and luggers can sail very much nearer to it.

Close Times, those seasons of the year during which, by law or by mutual agreement, game, wild birds, salmon, certain animals, and certain fish may not be shot or caught. These C. T. vary to a certain extent in different countries and localities, but they will generally be found to include the breeding or spawning times of the species in question. In most cases the C. T. in Great Britain are fixed by the game laws and a series of Wild Birds Protection Acts, of which the chief were passed in 1880, 1904, and 1908, but in some cases sportsmen are ruled by unwritten but equally binding rules. There is, for example, no statutory C. T. for foxes and rabbits, but in practice there is no fox-hunting from April till Nov. 1. Unwritten law likewise fixes the deer-hunting period for stags from about Aug. 12 to Oct. 12, and for hinds from Nov. 10 to the end of March. An Act of 1892 prohibits the sale of hares or leverets caught in Great Britain from March to July, under penalty of a heavy fine, and this has the effect of creating a close time. In Ireland this period is fixed from the beginning of April to Aug. 12. The close time for wild birds in the United Kingdom is from March 2 to the end of July, and certain eggs are also protected under the same Acts. In England and Wales hares, rabbits, woodcock, snipe, quail, landrail, and heath or moor game (and the eggs of swan, wild duck, teal, and widgeon) are protected under the game laws, though no close time is fixed for them by those laws. In Scotland the same remarks apply to deer and hares, to the first four birds, and to wild duck. The close time for all these birds is, under the

Wild Birds Protection Acts, 1880 to 1939, from March 2 to July 31 (inclusive). Otherwise this close time applies to all wild birds throughout Great Britain. The game laws fix the following times for various kinds of game, all dates inclusive: black game or heath fowl, Dec. 11 to Aug. 19 (in certain parts Aug. 31); grouse, Dec. 11 (Dec. 10, Scotland) to Aug. 11 in all parts of the United Kingdom; ptarmigan in England none, in Scotland Dec. 11 to Aug. 11, in Ireland Dec. 11 to Aug. 19; partridge Feb. 2 to Aug. 31 throughout; pheasant Feb. 2 to Sept. 30 throughout. Christmas Day and all Sundays are C. T. for game. In Ireland male deer are protected from Jan. 1 to June 9, fallow deer from Sept. 29 to June 9, hares from April 20 to Aug. 12, landrail from Jan. 11 to Sept. 19, and quail from Jan. 11 to Sept. 19. In England and Scotland the two last-named come under the Wild Birds Protection Acts already referred to. Otter-hunting lasts from April 15 to Sept. 15. In addition to these general rules, provisions are made by the secretary of state by which protection may be granted to certain birds in particular localities at other times on application from the local authorities. The Salmon Fisheries Act, fixing the close time in England and Wales for nets from Sept. 1 to Feb. 1, and for rods from Nov. 2 to Feb. 1, has been varied considerably in different parts of the country, but it always begins for nets not later than Nov. 1, and lasts for a minimum of 154 days. For rods it must not begin later than Dec. 1, and the minimum period is ninety-two days. In Scotland the close time for salmon, usually lasting from Aug. 27 to Feb. 10 for nets, and from Nov. 1 to Feb. 10 for rods, must not be less than 168 days for nets, either in England and Wales, or in Ireland. There are also weekly C. T., including Sunday, which vary from twenty-four to forty-eight hours. The Fresh-water Fisheries Act of 1874 fixed a close time for fresh-water fish not caught in private waters from mid March to mid June, except for certain specified parts of the country. Crabs and lobsters under a certain size (crabs 4½ in. across back, lobsters 8 in. in length) may not be sold, and protection is also given to soft crabs and crabs with spawn. The protection of oysters varies according to local regulations. A general close time for deep-sea oysters is fixed by the Fisheries Act of 1877 in Great Britain from June 15 to Aug. 4. There are game laws and various regulations for the protection of animals in most countries, sometimes of an extremely stringent nature.

Closure, or *Clôture*, in parl. procedure a method of putting an end to a debate which compels the House to decide upon the matter under discussion. The C. was first authorised by the Urgency Rules of Feb. 3, 1881, upon a motion to vest in the Speaker the powers of the House for the regulation of its business. The obstructionist methods of the Irish Nationalist members during the debates on the Protection of Person and Property (Ire-

land) Bill, the Prevention of Crimes (Ireland) Bill, and the Place Preservation (Ireland) Bill induced the House to carry the motion, which was afterwards permanently estab. by a standing order in 1882. That order provides that the opinion of the House may be taken forthwith upon any motion, 'that the question be now put'; the C. may be moved either at the conclusion of a speech or whilst a member is addressing the House, and, in the latter event, it intercepts any motion which it was the Speaker's intention to submit. The Speaker (or chairman of ways and means) has an absolute discretion in allowing a C. motion to be put; but in practice he only intervenes where such a motion is in his opinion an abuse of the rules of the House or an infringement of the rights of the minority. Analogous to the C. are the motions 'that certain words in the clause stand part of the clause', or 'that a clause stand part of (or be added to) the Bill'; such motions override all power of amendment. C. may also be moved at the moment for 'interruption of business'—that is, at the expiration of the time fixed for the transaction of certain business when the Speaker adjourns the debate and vacates the chair to make his report to the House. Reflections on the vote of C. are out of order, as are also questions to ministers respecting C. The presence of more than one hundred members is required to make the C. vote effectual, or twenty in the case of the C. being put in a standing committee. A far more drastic method of curtailing the length of a debate is that of C. by compartments, called also the guillotine. This is a device whereby a definite period or periods may be set apart by the rules of the House for the discussion of the various stages and portions of a Bill; at the expiration of each period of time the discussion is automatically closed, whether concluded or not, without the leave of the Speaker or chairman being required, and the majority in the House carry that portion of the Bill. It was first used in 1887 on the occasion of the Common Law Procedure (Ireland) Bill; it was also used in the debates on the Home Rule Bill, 1893, and the Education Bill, 1902. From the return of the Liberals in 1906 it became a characteristic feature of parl. procedure.

Clotaire I. (A.D. 558-61), king of Gaul, was one of the four sons of Clovis, who, at his father's death, received his share of the kingdom, including the cities of Soissons, Cambrai, and Laon. By arranging for the murder of his brother's children, he secured Tours and Poitiers in 524, and ten years later, after the fall of Burgundy, acquired Grenoble. In fact his whole reign was one of annexations. At the death of Childebert, his brother, with whom he had warred against the Visigoths, he became king of all Gaul (558), and he also ruled over most of Germany and exacted tribute from the Saxons. He d. of remorse, because he had burnt alive his rebel son, Chram, with his wife and children.

Clotaire II. (d. 629), after varying fortunes of war finally became king of the whole Frankish kingdom in 613. The many concessions he made account for the comparative tranquillity of his rule. To the Burgundian nobles he gave the option of a special mayor, and to his own barons he allowed some freedom to draw up laws. In his reign unjust taxes were repealed.

Cloth, see **CLOTH MANUFACTURE AND FINISHING; COTTON, FABRICS, TEXTILE.**

Clothilde, or **Clotilda**, St. (475-545), daughter of Chilperic, king of Burgundy, and the wife of Clovis, king of the Franks. She exerted great influence over her husband, and persuaded him to become a Christian. Together they built the church of the Holy Apostles at Paris, afterwards called *Ste. Geneviève*, in which they were both buried. At the death of Clovis, C. retired to the abbey of St. Martin at Tours.

Cloth Manufacture and Finishing. All cloth on leaving the loom presents a loose and thready appearance. The type of weave, however, is carefully chosen with a view to the use to which the material is to be put, but the essentials of weaving do not vary with the raw materials used, whether they are vegetable products—cotton, jute, artificial silk, etc.—or animal products—wool, camel-hair, alpaca, silk, etc. Metal threads of gold and silver are also used for decoration, and asbestos fibres for fireproof curtains, etc. (see under **FABRICS, TEXTILE**). Cloth is manufactured in variable widths according to its uses, but modern manufacturers favour broad looms, wide fabrics being economical in use. Besides width, weight is an important factor in the manufacture of cloth, especially of woollens and worsteds, and cloth also undergoes tests to estimate its tensile strength. After the cloth is woven, the finishing processes to which it is then submitted vary according to the material. The purpose of finishing is to smarten the cloth and to bring out the valuable properties peculiar to the stuff of which it is made. If nothing but cleaning and pressing is needed, the appearance of the cloth is not very much altered from when it first left the loom, but generally the alteration is considerable. The first stage in the finishing process is to remedy all defects in the weaving. The examination of the cloth is called *perching*, and this is followed by another exercise, called *picking*, which, as the name implies, means picking out all foreign matter such as hairs, straws, etc. *Burling* is to ensure that the cloth is perfectly smooth and free from knots, for every knot has to be unravelled and every missing thread replaced by hand. The grade of quality obtained is decided by the purpose for which the cloth was woven. It is nearly always necessary to pass the cloth through a bath of soapy water to wash out any dirt or oil accumulated during weaving. The washing softens the cloth and brings out a fuzzy nap which may be removed by singeing. In some woollen fabrics, however, the surface nap is desirable, and may be

further brushed up with a wire brush. One of the processes through which cotton fabrics may be passed is known as *beetling*. This, which can be done by machinery, consists in hammering the surface of the cloth to close up the threads and produce a hard bright finish. A similar process applied to woollen fabrics is *milling*. After scouring the fibres of the soapy wool curl up, and they are felted together and the cloth is thickened by pressure and friction applied alternately. Wool can also be put through a process of raising, which is effected by the *teasel* in a machine called the *raising-gig*. The teasel raises a pile on the surface of the cloth, either an erect pile, termed *velvet*, or a laid pile, smoothed in one direction. Raising gives an increased softness, conceals the threads, and subdues the colour and patterns of the cloth. Usually the cloth is milled before raising, but if the pile is raised immediately after the cloth has been scoured, it becomes much softer. Union fabrics, woven with cotton-warp and wool-weft, undergo an additional treatment called *crabbing*, the purpose of this being to straighten out the cotton threads and submerge them beneath the woollen surface of the weft. If during these processes the length and breadth of the cloth have been altered, the cloth is brought back to the required dimensions by '*stentering*.' The stenter is a frame on which the cloth is stretched and straightened out. Stentering is particularly applied to light cotton cloths which require dressing or which have been mercerised. If it is required to stiffen the cotton, this is done by applying a starch mixture while the cloth is being passed through a mangle. The final finishing treatment is to press the cloth and, if a lustrous surface is desired, to apply heat and moisture at the same time. In addition to finishing in the sense of cloth development, the work of preparing cloth includes bleaching, dyeing, and printing. All cloth on leaving the looms has a dull colour, and is spoken of as being '*in the grey*.' Cotton goods are bleached with chlorine, but wool is generally passed through sulphur fumes, and if further whiteness is required peroxide is used. Silk can be whitened by boiling in soap solution. Coloured cloth is either made from dyed yarn or else is dyed in the piece. Dyeing machines are generally made to take a number of pieces at once, and the cloth is immersed in a heated solution. Cotton and silk cloths may be readily printed with patterns and designs. Printing is done by a machine consisting of a revolving drum with sometimes as many as twenty rollers, each having a separate trough of colour, and the cloth receives an impression from each roller which is engraved with the desired pattern. For the treatment of separate stuffs see under **COTTON, WOOL, SILK**. See also J. A. Hunter, *Cloths and the Cloth Trade*, 1926; R. Beaumont, *The Finishing of Textile Fabrics*, 1926; E. Midgley, *The Finishing of Woollen Fabrics*, 1929; H. Greenwood, *Handbook of Weaving and Manufacture*, 1926; S. R. Trotman and

P. L. Thorp, *Principles of Bleaching and Finishing Cotton*, 1927.

Clothing, see FASHION.

Cloth, one of the Fates. See MOIRÉ.
Clothyard, yard-rod, once used for measuring cloth. The length of the arrow was taken from it.

Closure, see CLOSURE.

Cloud, mass of mist consisting of minute globules of water formed of condensed aqueous vapour floating in the atmosphere. Sometimes the condensed vapour is solidified into minute fragments of ice or snow, this being particularly the case with cirrus, cirro-stratus, and cirro-cumulus Cs., where the refraction of light by the ice-crystals often gives the appearance of a halo. In outline the classification of the Cs. is based upon that originally put forward by Luke Howard at the beginning of the nineteenth century, namely, cirrus, the thread C.; cumulus, the heap C.; stratus, the flat C. or level sheet; and nimbus, the rain C. The details of a more precise classification occupied the attention of meteorologists in many countries during the latter part of the century, among whom were specially prominent the Englishmen, the Rev. Clement Ley and the Honourable Ralph Abercromby. Other meteorologists who were specially active in this work were Prof. H. H. Hildebrandsson, of Uppsala, Sweden; M. Léon Teisserenc de Bort, of Paris; and M. A. Riggenbach, of Zürich, Switzerland. A classification was agreed at the international conference at Munich in 1891, and as a sequel the first ed. of the *International Atlas of Clouds* appeared in 1895; the last appeared in 1910, and is now out of print. After the First World War the need for a new atlas was acutely felt, and an international commission for the study of Cs. was set up in 1922, under the presidency of Gen. E. Delcambre, the director of the Office National Météorologique de France, to undertake this work. An 'Abridged edition for the use of observers' was produced in 1930, and the complete atlas with separate eds. having the text in Fr., Eng., and Ger. was pub. in 1932. In this atlas a modification was introduced which was of very great importance. In the earlier atlas the C. had been considered as an entity rather than as a feature of the sky which should be considered in relation, not only to all the other Cs. present, but also to the development in time. This involved some radical changes in the conception of how Cs. should be viewed, and some differences in the nomenclature of clouds. This conception has led to the international codes for reporting C. types, and in the atlas an attempt was made to give in order examples not only of the basic classification but also of the sky types to which numbers are given in the reporting codes. After the Second World War, 1939-45, some amendments were made to the reporting codes at the twelfth conference of directors, held at Washington, D.C., in 1947: the most important new features are the omission of 'nimbus' and the inclusion of the new type 'nimbostratus.'

The following summary of the international classification is based on Part I. of the Eng. ed. of the *International Atlas of Clouds*.

TABLE OF CLOUD CLASSIFICATION.

At nearly all levels Cs. may appear under the following forms: (a) Isolated, heap Cs. with vertical development during their formation, and a spreading out when they are dissolving; (b) Sheet Cs. which are divided up into filaments, scales, or rounded masses, and which are often stable or in process of disintegration; (c) More or less continuous C. sheets, often in process of formation or growth.

Classification into families and genera is as follows:

Family A consists of high Cs. (mean lower level 6000 metres (20,000 ft.)). It should be noted that the heights given are for temperate lats., and refer, not to sea level, but to the general level of the land in the region. In certain cases there may be large departures from the given mean heights, especially as regards cirrus, which may be found at any height where ice crystals can exist.

Form b 1. Genus Cirrus.

2. Genus Cirrocumulus.

Form c 3. Genus Cirrostratus.

Family B: Middle Cs. (mean upper level 6000 metres (20,000 ft.), mean lower level 2000 metres (6500 ft.)).

Form a } 4. Genus Altopcumulus.

Form b }

Most altocumulus and stratocumulus Cs. come under category b; but the varieties cumuliformis and particularly castellatus belong to category a.

Form c 5. Genus Altostratus.

Family C: Low Cs. (mean upper level 2000 metres (6500 ft.), mean lower level close to the ground).

Form a } 6. Genus Stratocumulus.

Form b }

Most altocumulus and stratocumulus Cs. come under category b; but the varieties cumuliformis and particularly castellatus belong to category a.

Form c } 7. Genus Stratus.

8. Genus Nimbostratus.

Family D: Cs. with vertical development (mean upper level that of the cirrus, mean lower level 500 metres (1600 ft.)).

Form a } 9. Genus Cumulus.

10. Genus Cumulonimbus.

DEFINITIONS AND DESCRIPTIONS OF THE FORMS OF CLOUDS.

(1) *Cirrus* (Ci.), detached clouds of delicate and fibrous appearance, without shading, generally white in colour, often of a silky appearance. Cirrus appears in the most varied forms such as isolated tufts, lines drawn across a blue sky, branching feather-like plumes, curved lines ending in tufts, etc.; they are often arranged in bands which cross the sky like meridian lines, and which, owing to the effect of perspective, converge to a

point on the horizon, or to two opposite points (cirrostratus and cirrocumulus often take part in the formation of these bands).

(2) *Cirrocumulus* (Cc.), cirriform layer or patch composed of small white flakes or of very small globular masses, without shadows, which are arranged in groups or lines, or more often in ripples resembling those of the sand on the sea shore. In general cirrocumulus represents a degraded state of cirrus and cirrostratus both of which may change into it. In this case the changing patches often retain some fibrous structure in places.

Real cirrocumulus is uncommon. It must not be confused with small altocumulus on the edges of altocumulus sheets.

(3) *Cirrostratus* (Cs.), thin whitish veil, which does not blur the outlines of the sun or moon, but gives rise to halos. Sometimes it is quite diffuse and merely gives the sky a milky look; sometimes it more or less distinctly shows a fibrous structure with disordered filaments.

(4) *Altostratus* (Ac.), layer (or patches), composed of laminae or rather flattened globular masses, the smallest elements of the regularly arranged layer being fairly small and thin, with or without shading. These elements are arranged in groups, in lines or waves, following one or two directions, and are sometimes so close together that their edges join. The thin and translucent edges of the elements often show *irisations* which are rather characteristic of this class of C.

(5) *Altostratus* (As.), striated or fibrous veil, more or less grey or bluish in colour. This C. is like thick cirrostratus, but without halo phenomena; the sun or moon shows vaguely, with a faint gleam, as though through ground glass. Sometimes the sheet is thin with forms intermediate with cirrostratus (altostratus translucent). Sometimes it is very thick and dark (altostratus opacus), sometimes even completely hiding the sun or moon. In this case differences of thickness may cause relatively light patches between very dark parts; but the surface never shows real relief, and the striated or fibrous structure is always seen in places in the body of the C.

(6) *Stratocumulus* (Sc.), layer (or patches) composed of globular masses or rolls; the smallest of the regularly arranged elements are fairly large; they are soft and grey, with darker parts. These elements are arranged in groups, in lines, or in waves, aligned in one or in two directions. Very often the rolls are so close that their edges join together; when they cover the whole sky—on the Continent, especially in winter—they have a wavy appearance.

(7) *Stratus* (St.), uniform layer of C., resembling fog, but not resting on the ground. When this very low layer is broken up into irregular shreds it is designated *fractostratus* (Fs.).

(8) *Nimbostratus* (Ns.), low, amorphous and rainy layer, of a dark grey colour and nearly uniform. It appears as though feebly illuminated seemingly from inside.

When it gives precipitation this is in the form of continuous rain or snow. But precipitation alone is not sufficient criterion to distinguish the C. which should be called *nimbostratus* even when no rain or snow falls from it. There is often precipitation which does not reach the ground; in this case the base of the C. is always diffuse and looks 'wet' on account of the general trailing precipitation, *virga*, so that it is not possible to determine the limit of its lower surface.

(9) *Cumulus* (Cu.), thick Cs. with vertical development; the upper surface is dome shaped and exhibits rounded protuberances, while the base is nearly horizontal. When the C. is opposite the sun the surfaces normal to the observer are brighter than the edges of the protuberances. When the light comes from the side the Cs. exhibit strong contrasts of light and shade; against the sun, on the other hand, they look dark with a bright edge. True cumulus is definitely limited above and below; its surface often appears hard and clear cut. But one may also observe a C. resembling ragged cumulus in which the different parts show constant change. This C. is designated *fractocumulus* (Fc.).

(10) *Cumulonimbus* (Cb.), heavy masses of C., with great vertical development, whose cumuliform summits rise in the form of mts. or towers, the upper parts having a fibrous texture and often spreading out in the shape of an anvil. The base resembles *nimbostratus*, and one generally notices *virga*. This base has often a layer of very low ragged Cs. below it (*fractostratus*, *fractocumulus*). *Cumulonimbus* Cs. generally produce showers of rain or snow and sometimes of hail or soft hail, and often thunderstorms as well. If the whole of the C. cannot be seen the fall of a real shower is enough to characterise the C. as a *cumulonimbus*.

PRINCIPAL VARIETIES OF CLOUDS.

In addition to *families* and *genera* which suffice for the broad classification of C. forms, the new International Atlas also recognises *sub-genera*, *species*, *varieties*, and *casual details* to which distinguishing Lat. adjectives are applied for purposes of more precise differentiation. For details of these sub-classifications reference should be made to the atlas. Among the most important of these sub-classifications are those distinguished by the adjectives 'cumuliformis,' 'lenticularis,' 'castellatus,' and 'mammatus.'

See Air Ministry (Meteorological Office) N.O. 233, *Cloud Forms* (1949), from which the above text is reprinted, by permission of the Controller of His Majesty's Stationery Office; also G. A. Clarke, *Clouds*, 1920; A. W. Clayton, *Cloud Studies*, 1925; C. J. P. Cave, *Clouds and Weather Phenomena*, 1926, 1943.

Cloudberry, see *RUBUS CHAMAMORUS*.
Clouded Leopard, see *LEOPARD*.

Clouet, François (c. 1610-72), Fr. painter, son of Jean C. the Younger (c. 1485-1545). Father and son were noted miniaturists. He succeeded his father in the

twofold office of *valet de chambre* and painter-in-ordinary to Francis I. in 1545 and held the post under Henry II. and Charles IX. He executed portraits of Henry II., Mary Queen of Scots, and Catherine de' Medici (now in Castle Howard, Yorkshire). There is a portrait of Francis II. as an infant in the Antwerp Museum, and sev. of his paintings are in the Louvre, Vienna, Florence, and other European cities and there is a fine series of his drawings in the National Library, Paris, some crayon heads in the Brit. Museum and examples of his portraiture in Hampton Court and Hertford House, London.

Clough, Anne Jemima (1820-92), pioneer in the higher education of women, appointed the first principal of Newnham College, Cambridge. B. in Liverpool, Jan. 20, sister of Arthur Hugh C. In 1871 she became head of the first house for women students in Cambridge. This house developed into Newnham Hall and, in 1880, into Newnham College.

Clough, Arthur Hugh (1819-61), Eng. poet, b. at Liverpool. In 1822 his father, a cotton merchant, emigrated to Charleston, S. Carolina, U.S.A., with his family. In 1828 C. returned to England to school at Chester; from there he passed to Rugby, then under Dr. Arnold, and to Balliol College, Oxford. In 1842 he was elected to a fellowship at Oriel College, Oxford at this time was in the throes of fierce theological controversy, and C. fell for a time under the influence of Newman's High Church principles; this was followed by a period of scepticism, and in 1848 he felt called upon to resign his post. Then he travelled for a time, and was in Paris during the revolutionary movements of 1849, and at Rome during its siege by the Fr. From 1849 to 1852 he was principal of Univ. Hall, London. In 1854 he married, and in 1856 was appointed secretary to the commission for examining scientific military schools on the Continent. In 1848 he pub. *The Bohic of Tober-na-Vuolich*, a 'long-vacation pastoral' in hexameters; in 1849 a collection of poems, called *Ambarvalia*, with his friend, Thomas Burbidge. In the same year he wrote *Amours de Voyage*, a novel in verse, at Rome; *Dipsychus*, a satire, at Venice, 1850; and *Mari Magno*, or *Tales on Board*, a series of idylls, 1861. *Plutarch's Lives* (1859) was a revision of Ryden's and other seventeenth-century translators' ed. of Plutarch. His work contains much deep thought and clever experiment with hexameters, but, except in the case of a few of his lyrics, never rises to great worth or beauty. C. is the subject of Matthew Arnold's beautiful elegy, *Thyrsis*. His collected *Poems* were ed., with a memoir by F. T. Palgrave, 1862. See monographs by S. Waddington, 1833, J. I. Osborne, 1920, and G. Levy, 1938.

Clovelly, fishing vill. of N. Devon, 11 m. W.S.W. of Bideford in the Barnstaple par. div. of Devonshire. It is situated in a cleft of the rocks, sheltered on three sides by thick woods and in the midst of magnificent scenery. Its main street,

composed of rough steps between white-washed houses, descends 400 ft. to a rude little pier. There is an anct. Brit. encampment a mile away. Pop. 650.

Clover, name given to various species of *Trifolium*, the leguminous genus to which belong the shamrock and trefoil. C. was introduced into the agriculture of Great Britain about the sixteenth century from the Low Countries, where it had long been cultivated as green food for cattle in situations where natural pastures were scarce. The species are ann., biennial, or perennial plants, and of these the biennial produces the richest crop. Red C. is the most approved variety, and is usually sown with barley or oats, sometimes among wheat or rye in spring. The first crop is generally mown and made into hay, which must be perfectly dry before it is stacked, and in winter it provides a very nutritious food for cattle. White C. is a perennial which grows rapidly and forms excellent pasture, especially for sheep; a light calcareous soil is best adapted for its growth. It is also valuable to man as a source of honey. Another perennial C. is the cow-grass, which is found in all rich meadows, and is often sown in conjunction with white C. *T. minus*, the lesser yellow trefoil, and *T. procumbens*, the hop trefoil, are also valuable varieties found in good pastures. The only ann. C. which is cultivated is *T. incarnatum*, a species which has been brought from the E. The lt. rye-grass, *Lolium perenne italicum*, is often sown with it and will grow as rapidly; it is a good corrective of the heating qualities of C. hay. The prin. use of this C. is to raise very early food for ewes and lambs.

Cloves (M.E. *clow* (e) from Fr. *clou*, a nail), dried, unexpanding flower-buds of the clove-tree (*Eugenia caryophyllata*), a plant belonging to the order Myrtaceae, a native of the Molucca Is. The tree is an evergreen, growing to about 40 ft. in height, with large oval leaves and small flowers, produced in great numbers in cymes, which become red when ready for picking. The entire plant has an aromatic odour. The buds, when gathered, are a little over half an inch long, and consist of a cylindrical calyx, at the end of which are four extended sepals and a ball formed by four unopened petals. They are dried either in the sun or by wood smoke, and then become of a reddish-brown colour. They have a very powerful odour and a hot and acrid taste, and on pressure exude a volatile oil, of which they contain a large proportion, about one-fifth of their entire weight. C. are mainly used for flavouring in cookery and confectionery, and also to preserve clothing from moths. The essential oil is extracted by means of repeated distillation with water, and when carefully prepared is of a pale yellow colour, later turning to brown, and with the taste and odour of C. It is known to the pharmacopoeia as *Oleum caryophylli*, and is a mixture of eugenol ($C_{11}H_{12}O_2$) and a hydrocarbon ($C_{11}H_{14}$). The oil is soluble in alcohol, ether, and fixed oils.

It is used in medicine as a flavouring agent and to prevent nausea and griping caused by purgatives. Its volatile qualities make it valuable to relieve toothache, and it is also used as a local anæsthetic. C. are now chiefly cultivated in Amboyna, Zanzibar, Pemba, Java, Sumatra, Réunion, and the W. Indies. The Dutch long held the monopoly of clove-growing in the Moluccas.

Clovis, Chlodowech, or Chlodwig, name of two Merovingian kings of the Franks:

Clovis I. (c. 465-511) succeeded his father Childeric in the year 481, as king of the Salian Franks, whose cap. was Tournai, in the modern Hainaut. In 486 he overthrew the Gallo-Roms. under Syagrius, near Soissons; in 493 married Clotilda, a Christian Burgundian princess, and in 496 embraced her faith. In 507 he defeated and killed Alaric II., the Arian king of the Visigoths, at Vouillé, but was checked at Arles by Theodoric, king of the Ostrogoths. He then settled in Paris, where he d. His chief aim was a united Frankish kingdom.

Clovis II. (633-56), succeeded his father, Dagobert I. in 638 as king of Neustria and Burgundy. In 656 he procured the assassination of the usurping king of Austrasia, annexed his dominions, and thus became king of the whole Frankish empire.

Clowes, William (c. 1540-1604), eminent Eng. surgeon in the reign of Elizabeth. He was surgeon at St. Bartholomew's Hospital, served in the Netherlands with Leicester, and took part in the defeat of the Sp. Armada, becoming surgeon to the queen later. He wrote sev. books, the chief of which are *The Approved Practice for all Young Surgeons* (1591) and *A Treatise on the Struma* (1602).

Clowes, William (1780-1851), joint founder with Hugh Bourne of Primitive Methodism, was a native of Burslem, who came to live at Tunstall. Here he worked as a potter and gained a reputation as an excellent dancer. Attracted by the open-air meetings of Bourne, which differed from Wesley's 'camp meeting' in having both prayers and singing, he early joined a Methodist class, visited the country cottages as an evangelist, and held prayer meetings and love-feasts in his home. C. supported Bourne in his efforts to hold religious meetings, which should persuade men to renounce their par. wakes and the drunkenness and other vicious habits there practised. The new brotherhood, which had at first availed itself of Wesleyan Methodist protection, definitely repudiated all connection with Wesleyans in 1810. Even C., who had leanings towards the older sect, was cut off from his church in 1808 and 1810 for officiating at camp meetings in Ramsor. In 1811 he became the preacher at a chapel in Tunstall of a small society of Primitive Methodists who had first met together in a kitchen. After 1827 C. gave up circuit work, but continued his mission of evangelisation till his death. He was a man of fine presence and engaging disposition, and his strong personality, with which was combined a fine and enthusi-

astic delivery, secured many converts to his cause. The influence of the movement to which C. gave his life is well reflected in the works of George Eliot, George Borrow, and Arnold Bennett.

Clowes, Sir William Laird (1856-1905), Brit. naval writer and historian. His series of articles, under the pseudonym 'Nauticus,' in the *Daily Graphic* (1893) entitled 'The Needs of the Navy,' had an enormous influence on public and official opinion. In 1891 he had been largely instrumental in the foundation of the Navy Records Society, and between 1897 and 1903 he compiled *The Royal Navy: its History from the Earliest Times*, in collaboration with Sir Clements Markham and others. Among his other works are *Black America: a Study of the Ex-Slave and his Late Master* (1891); *The Great Peril* (1893); *The Naval Campaign of Lissa* (1901); *The Mercantile Marine in War Time* (1902); *Four Modern Naval Campaigns* (1902).

Clown, buffoon, formerly attached to the households of nobles, now a comic character in a pantomime. See JESTER.

Cloyne, mkt. tn. of co. Cork, Eire, 15 m. E.S.E. of Cork. It gives its name to a Rom. Catholic diocese, the cathedral of which is at Queenstown, but it has a Protestant cathedral of its own, founded by St. Colman in the sixth century. Opposite the cathedral is a splendid and well-preserved round tower which rises to a height of 90 ft. Pop. 700.

Clubbing, or Club-root, disease which often attacks the roots of turnips, cabbages, and other cruciferous plants, usually the result of improper cultivation. It is due to the ravages of a slime-fungus, *Plasmodiophora brassicæ*. It causes the host plant to send out nodular outgrowths from the root with subsequent gradual decay of the plant itself; the skin becomes broken and scabbed, in this way differing from 'finger-and-toe' (dactylorhiza) disease, which is rather a gradual degeneration of the plant than a disease; in this case the skin remains unbroken. Lime is the best disinfectant against C., because the spores of the lime fungus cannot germinate in it or penetrate it. Any cruciferous plant can spread the disease, so it is not safe to grow them in soil that has once been infected, unless it is previously thoroughly dressed with lime. The spores will lie dormant for sev. years if no suitable host presents itself, but germinates actively as soon as any crucifer is present.

Club-foot (Talipes), deformity of the foot depending on contraction of certain muscles or tendons. It may be congenital or acquired. If congenital, the cause may be malnutrition or a long-sustained pressure upon the foot in the womb. Many cases of the congenital defect, however, submit to early treatment, and no further evidence of spinal lesion has appeared. When the deformity is acquired, it is almost invariably the result of infantile paralysis; certain muscles retain their function, and their prolonged contraction is followed by shortening of the ligaments connecting

the bones. The varieties of C. are (1) *T. equinus*, where the subject walks upon the fore part of the foot, the heel not touching the ground; (2) *T. varus* where the outer edge of the sole touches the ground, the foot being turned inwards; (3) *T. calcaneus*, where the heel only touches the ground, the toes being pointed upwards; and (4) *T. valgus*, where the subject walks upon the inner edge of the sole. The former two are the congenital types, and are often combined, when the deformity is known as *T. equino-varus*. The latter two are nearly always acquired. Somewhat similar conditions are *T. cavus*, where the bony arch is unusually concave, and *T. planus*, where the bony arch has been too weak to bear the weight of the body. This defect is popularly known as flatfoot, and is often developed through much standing, particularly in poorly nourished persons. Treatment of C. should, above all, be prompt. If it is congenital, efforts should be made by constant manipulation to encourage the foot to take up a normal position. If this is unsuccessful, it may be necessary to separate the contracted tendons by surgical operation. The foot is then kept immovable in the normal position by being set in plaster of Paris until the tendons and ligaments have grown to the required extent. Generally it is also necessary to apply a splint which keeps the foot in the correct position, so that, as growth goes on, the bones are moulded to the proper shape in a few months.

Club-hand, deformity of the hand similar to that of club-foot. The hand is permanently bent at the wrist, by contraction of the flexor muscles, or is bent backwards, as by contraction of the extensors. It is a result of poor nutrition, and is often associated with other deformities. The fingers of the affected hand are weak or useless.

Club-root, see CLUBBING.

Clubs, associations of people united in pursuance of a common interest. All through Gk. hist. there were both oligarchic and democratic *irapeiai* or political organisations among the people. At Rome associations similar to the latter were called *sodalitates*. Thus about 204 B.C. a *sodalitas* was formed for the worship of Mater Magna, and under the empire the deification of Augustus and other emperors was promoted by prov. *sodalitates*. The *collegia opificum* of the republic corresponded to the medieval trade guilds. In Cicero's day these had been supplanted by the *collegia compitalicia* or *sodalicia*, which were political institutions finally suppressed by Cæsar as a public menace. The most obvious purpose of C. to-day is the promotion of social intercourse, but many C. have been formed for the serious discussion of politics, literature, science, and art. The meetings at the Mermaid Tavern (q.v.) in* Bread Street, were gatherings of literary friends fond of good-fellowship, who would sit together over their cups and discuss books and men till daybreak. It was an illustrious company who passed their evenings at the 'Mer-

maid,' including Shakespeare, Beaumont and Fletcher, and many another Elizabethan playwright. Some of the Stuart C. were professedly political, as, for example, the Rota and the Calves Head C. (founded 1659 and 1693). Addison was a member of the famous Kit-Cat Club (1700) and in the *Spectator* he refers to the coffee-houses which were the haunts of men of very varied tastes; one coffee-house was reserved for Whigs, another for lawyers, and a third for men of letters. The Tories used to fraternise at White's Chocolate House (1698), and 'The Club' (1764) was the resort of the most talented men of the times. There are upwards of 120 C. in London distinguished for their excellent traditions and organisation. Among them may be mentioned the Carlton (1832) and Constitutional (1840), both Conservative; the National Liberal (1881) and the Reform (1837); St. James's (1857), frequented by diplomats; the Garrick (1831), for artists and actors; the Travelers' (1819), and the Turf (1868); also Brooks's (1764); Junior Carlton (1864), United Service (1815), Devonshire (1875), United University (1821), Boodle's (1763), Conservative (1840), Eccentric (1890), Junior Army and Navy (1911), Marlborough (1869), Naval and Military (1862), and Savage (1857). In 1919 a club called the American was founded for Amers. in London. The Kildare Street Club of Dublin (1790) and the New Club (1787) of Edinburgh vie in excellence with those of the metropolis. Continental C. are often centres for gambling as well as for concerts, plays, etc. The modern club is not complete without its dining, smoking, newspaper, writing, billiard, and drawing rooms. The Athenæum (1824) possesses a unique library, and the Garrick a fine collection of dramatic pictures. New members are usually elected by a ballot of the whole club, or by a chosen committee. Some C. are reserved for gentlemen, others for ladies, whilst in a few both sexes are admitted on equal terms. Among the last type are the Sesame Imperial and Pioneer, the Curzon House Club—which absorbed the former Albemarle Club—and the Univ. of London Club (1914), which is open to all graduates. In this connection, it may be noted that the Authors' Club (1891) strictly excludes women, whilst the Empress Club (1897) is open only to women. Ann. subscriptions, entrance fees, and profits derived from the sale of provisions and wines consumed within the house are the main sources of revenue. After the First World War sev. C. sprang up as a direct after-effect, e.g. nursing or service C.; while sev. women's C. have been founded since the complete political emancipation of the sex. The Cowdray (1922) and the United Nursing Services (1921) are both C. for women nurses. The Royal Air Force Club (1917) in Piccadilly is open to flying officers of the R.A.F. (including ex-officers of the R.F.C. and R.N.A.S.). The English Speaking Union and the Overseas League both possess excellent premises and a large membership of both sexes on each

side of the Atlantic. The Connaught (1921) is open to public school men, either of professional standing or in one of the services. There are, of course, many C. devoted to some specialised interest, professional, financial, agric., sporting, etc., e.g. the Kennel Club (1873), Gresham (1843) and the City of London (1832), both for bankers and merchants, Farmers' Club (1842), Flyfishers' Club (1844), and the M.C.C. (q.v.). C. formed during the Second World War include the King Alfred Club (1944), for officers of the R.N.V.R.; the Women's Press Club (1944), United Nations Services Officers' (1942), and Women's United Services (1942) for women officers.

pest, on the Little Szamor R. Formerly the cap. of Transylvania, the tn. is well built and has a Gothic church, museum, and a citadel. There are four bishoprics—National Orthodox Church of Rumania, Gk. Catholic (Uniate), Reformed Church, and Unitarian; the tn. is the literary centre of Transylvania and has many educational establs., including a univ. Before the Second World War there were manufs. of linen and woollen goods, earthenware, beer, sugar, paper, and soap. Formerly Hungarian, it passed to Rumania after the First World War, and is now known by its Rumanian name of C. By the end of Aug. 1944 Soviet forces were consolidating their grip on the chief



Cadbury Brothers Ltd.

WHITE'S CHOCOLATE HOUSE, ST. JAMES'S, IN 1708

A modern painting by H. W. White.

The tendency of inferior C. and of some C. for working men to degenerate into mere drinking and sometimes gambling saloons, led to their inclusion in the Licensing Act of 1902. The terms of this Act, designed above all to check the private sale of intoxicating liquors, apply indifferently to all C. Not only must every club register its name, object, membership, rules, hours of opening and closing, etc., but heavy penalties are attached to the traffic in liquor at an unregistered association or to granting habitual facilities to any one to become a member within forty-eight hours of nomination. Under the Act of 1921, a club in which the sale of intoxicants is made only as part of a meal may sell intoxicants for the space of one hour after the close of the permitted hours. See M. E. G. Duff, *The Club, 1764-1905*, 1905; R. J. Allen, *Clubs of Augustan London*, 1933; B. Darwin, *British Clubs*, 1943. See also under LICENCES AND LICENSING LAW.

Club-shell, see CLAVAGELLA.

Clugia, see CHIOGIA.

Cluj (Hungarian Kolozsvar, Ger. Klausenburg), tn. and episcopal see of Transylvania, Rumania, 248 m. E.S.E. of Buda-

pest, on the Little Szamor R. Formerly the cap. of Transylvania, the tn. is well built and has a Gothic church, museum, and a citadel. There are four bishoprics—National Orthodox Church of Rumania, Gk. Catholic (Uniate), Reformed Church, and Unitarian; the tn. is the literary centre of Transylvania and has many educational establs., including a univ. Before the Second World War there were manufs. of linen and woollen goods, earthenware, beer, sugar, paper, and soap. Formerly Hungarian, it passed to Rumania after the First World War, and is now known by its Rumanian name of C. By the end of Aug. 1944 Soviet forces were consolidating their grip on the chief

passes leading into Transylvania, and C. would have fallen had that event not been forestalled by the Rumanian gov.'s surrender. Pop. 98,000.

Clumber Spaniel, see under SPANIEL.

Clunes, tn. of Talbot co., Victoria, Australia, 97 m. N.W. of Melbourne by rail. It is in the gold-mining dist. opened up in 1851, and is also the centre of an agric. and pastoral industry. Pop. 1225.

Cluny, tn. on the Grosne, 14½ m. N.W. of Mâcon by rail, in the dept. of Saône-et-Loire, Central France. A vil. in 910, the year of the abbey foundation, it owed its later importance entirely to the C. monastery. The fame of the order of Cluniac Benedictines is due to the greatness of its abbots, who from 910 to 1157 were, with one exception, conspicuous alike for their piety and strength of will. Odo, the second abbot, made C. the centre of a great monastic revival. The result of his work and that of his successors was that, by 1150, 314 monasteries in all parts of Europe had embraced the C. régime, and were completely subject. The order declined rapidly after the death of Peter the Venerable in 1157, so that in 1528 the monastery fell into 'commendam' (q.v.) in 1790, after a regrettable schism between

the Reformed and Unreformed, the order was finally abolished. As commendatory abbots both Richelieu and Mazarin had initiated projects of reform. A great normal school was estab. here in 1865. Pop. 4100.

Clupeidae, family of malacopterygious fishes, contains many well-known species, such as the anchovy, herring, pilchard, and sprat. They have scaly bodies and a naked head, and the species inhabit temperate and tropical seas near the coast.

Cluseret, Gustave Paul (1823-1900), Fr. soldier and politician. He served in the Crimean war, as a *garde mobile* in the revolution of 1848, in sev. expeditions in Algeria under Garibaldi in 1860, and in 1861 on the side of the Federals in America. On his return to France he became a member of the Internationale, and on the proclamation of the Third Republic (1871) was the leading spirit of the social revolution at Lyons and Marseilles. In 1871 he was for a short time at the head of the military operations of the Paris Com., but narrowly escaped arrest by fleeing to London; in his absence he was condemned to death by the Third Council of War, 1872. In 1884 under an amnesty he returned to France, and in 1888-89 sat in the Chamber as deputy for Toulon.

Clusia, Amer. genus of Guttiferae, consists of climbing trees and shrubs, usually parasitical, which yield a viscid resinous juice of a balsamic flavour; hence they are in England called balsam-trees. *C. alba* has a scarlet fruit with seeds embedded in scarlet pulp. The plant abounds in balsamic juice of a green colour, which becomes brown when exposed to the air; the seeds are a favourite food of birds, and are plucked from the fruit while hanging on the tree. *C. quapoya* is a climbing shrub with yellow flowers, and yields a white, transparent juice.

Clusium, see CHIUSI.

Clusone, tn. and riv. of Italy. The riv. is a trib. of the Po, and has its source among the Alps about 12½ m. eastward of Mt. Genève. It flows in a S-easterly direction, passing the tns. of Fenestrelle and Pinerolo. After a course of 50 m., it joins the R. Po, 13 m. from Turin. The tn. is in Lombardy, 16 m. N.E. of Bergamo. There are copper, iron, and vitrol works, and a trade in corn. Pop. 6000.

Cluster. In astronomy a C. is a group of stars which differs from other groups (i.e. constellations and asterisms) in that the members of the group would seem to have some physical connection. In other words, the stars in a C. are not a mere optical group which happen to lie nearly in the line of sight, but have certain attributes in common. Thus they may have similar spectra and the group of stars may be moving together. The sky contains many Cs., of which the Pleiades are the best known. Most people can see with the naked eye six stars in this group, though especially keen-sighted people may discern six or seven more, but with the aid of an opera glass or a small telescope a

great many more are visible. The proper motion of the chief stars of the Pleiades and of some of the fainter ones has been shown to be the same, viz. 7" a century. The Pleiades belong to what are called irregular Cs.; the main part of the Cs. are globular in shape. Sir John Herschel's catalogue of nebulae (1864) contained a list of 110 globular Cs., and in the transactions pub. by the Lick Observatory there are many fine photographs of Cs. made by Messrs. Keeler and Perrins. Cs.



New Zealand Gov

THE CLUTHA RIVER, SOUTH ISLAND,
NEW ZEALAND

were often in the early days taken for nebulae, until resolved into separate stars by instruments of higher power. The number of stars in a C. is often very great, and in the photograph of the well-known C. round Omega Centauri Prof. Bailey found more than 5000 stars in an area occupying about as much space as the moon appears, to the naked eye, to occupy. A remarkable fact about globular Cs. is that they contain a large number of short-period variable stars, as many as 128 being found in the group mentioned immediately above. Most of the Cs. of both kinds are to be found in the neighbourhood of the Milky Way.

Clutch, device by which one shaft may be coupled to another, or released. It consists of a fixed and a movable part and when these parts are in contact the two shafts revolve together, and when the C. is disengaged or its one part moved away from the other, the shafts are independent of one another. The friction C. is commoner than the dog C., which operates rather in the manner of a zip fastener. But the materials used, the method of pressing the two surfaces together and the details of construction vary widely according to the conditions in which the C. is used. Cast-iron in contact with

cast-iron, steel on bronze, and steel or cast-iron on a fabric lining, are commonly used. The fabric lining consists mostly of asbestos and brass wire. In the magnetic C., the operating force, provided by a spring in other Cs. of the axial type, is produced by the magnetic attraction of one plate towards the other, acting as an electro-magnet.

Clutha, or **Molynieux**, riv. in the S. Is. of New Zealand. It rises in Lake Wanaka, and traversing the prov. of Otago, falls into the sea at Molynieux.

Cluthalite, mineral obtaining its name from the Clyde valley, where it was found. It is a red, flesh-coloured variety of analcime (a zeolite mineral which occurs as pellucid crystals in basalt). It occurs in vitreous crystals, and is a hydrous silicate of the zeolite section.

Cluwer (or **Cluwerius**), **Philp** (1580-1623), Ger. geographer and historian, was a great traveller. He served as a soldier in Bohemia and Hungary, and was for a time in prison. After further tours in France and the Brit. Isles, he returned to Leyden, where the academy allowed him a regular pension. His chief works were *Germania Antiqua* (1616); a treatise on anct. Sicily, Sardinia, and Corsica (1619); and his *Introductio in Universam Geographiam*, pub. posthumously in 1629.

Clywd, riv. which rises in S. Denbighshire, Wales, and flows past St. Asaph and Rhuddlan to the Irish Sea at Rhyl. The Elwy is the chief trib. Its valley is noted for its fine scenery.

Clyde (Welsh *Clyed*, meaning strong), chief riv. of Lanarkshire, Scotland, and one of the world's greatest commercial waterways. Its estuary forms the firth of Clyde, the finest on the W. coast. Daer Water, which rises in the Lowthers at Gana Hill (2190 ft.), and Potrail Water, which unite near Elvanfoot, are the chief head-streams of the C. It rounds Tinto Hill, and its course is fairly devious till a point 4 m. above Lanark is reached, after which it is, broadly speaking, N.-westerly as far as Dumbarton, where it discharges itself into the Firth. On the l. b. the prin. tribs. are the Duncaton (19 m. long), entering above Robertson; the Douglas (20 m.), above Bonnington; the Avon (28 m.), at Hamilton; and the White Cart (19 m.), below Renfrew; the affluents on the right are the Medwin (16 m.), joining the main stream near Carnwath; the Mouse, at Lanark; the S. Calder (16 m.), above Bothwell; the N. Calder (12 m.); and the Kelvin (21 m.), at Glasgow. Near Lanark the C. rapidly falls 230 ft. within 3½ m., forming the four famous falls of C., namely, the Bonnington Linn, which is the most graceful; the Corra Linn, which in three leaps makes a magnificent cascade 84 ft. in height; and the Dundaff and the Stonebyres Linn, the latter of which resembles the Corra. In flood-time both the Corra and the Stonebyres Falls make a single descent of 80 ft. or more. Stretching some 106 m. from its source in the Daer to Dumbarton, the C. is the third longest riv. in the country, the other two being the Spey and the Tay. Altogether

it drains an area of 1481 sq. m. Above the falls it is a pure trout stream, watering pastoral uplands. Below it traverses a fertile valley, sometimes pent up between wooded slopes, sometimes broadening out into a plain. But long before the riv. reaches Glasgow, where the pollution is completed, it grows every mile more sluggish and begrimed as it receives the contamination of various trade effluents. Even in the eighteenth century the C. was fordable in the heart of Glasgow. But neither effort nor money has been spared in deepening the channel, which is now 19 ft. at Glasgow even at low tide. Thus the docks at Glasgow can hold the largest vessels, and since Henry Bell launched the first steamer, the *Comet*, on the C. in 1812, the shipbuilding and shipping traffic has increased by leaps and bounds. A weir prevents the further ascent of the tide above Glasgow. The chief tns. on its banks from Elvanfoot to Glasgow are Crawford, Lanark, Hamilton, Bothwell, and Blantyre. The junction for the Forth and C. Canal is at Bowling. The ports are Glasgow, Port Glasgow, Greenock, Ardrossan, Troon, Ayr, and Campbelltown. The fairway of the Firth, which reaches from Dumbarton to Ailsa Craig, measures over 60 m., and from the Mull of Kintyre to Girvan is nearly 40 m. across. The chief ls. in the firth are Arran, Bute, and the Cumbraes, and among the sea lochs, many of which are popular holiday and health resorts, are Gareloch, Loch Long, Holy Loch, and Loch Fyne. These are all on the Highland coast.

There were savage air raids on the Clydeside, notably on March 13-14, 1941 and on May 5-6, 1941, when 460 and 350 machines respectively were used by the enemy. The number of persons killed was 1828. Incendiaries were dropped in masses like a locust-storm. Fires, spread by high explosives, raged with tremendous ferocity. But the raiders conspicuously failed to destroy the docks and shipyards. In Glasgow and Clydeside some 40,000 houses were damaged on those four nights, and great destruction was wrought to the large tenement blocks in Glasgow.

* **Clyde** The, name of a transport which landed Brit. troops on the Gallipoli Peninsula in the First World War in 1915. (See GALLIOLI CAMPAIGN.)

Clyde, Baron, see CAMPBELL, SIR COLIN. **Clydebank**, burgh of Dumbartonshire, Scotland, on the r. b. of the Clyde, 6 m. N.W. of Glasgow. Since 1886 Kilbowie and Dalmuir have been included in the burgh. At C. there are a shipbuilding yard and engineering works, at Kilbowie the factories of the Singer Manufacturing Company, and at Dalmuir a shipbuilding yard, a new tn. hall, and public library. Pop. (estimated) 34,500.

Clydesdale, valley of the Clyde (q.v.), in Lanarkshire, Scotland. Iron and coal are mined in it, and there are many orchards. It gives its name to a well-known breed of heavy horses.

Clydesdale Breed, see under HORSES. **Clydesdale Terrier**, or **Paisley Terrier**, resembles the prick-eared variety of Skye

terrier. It was only introduced about fifty years ago, and is kept entirely as a house-dog. It has a long, silky coat, and is light-coloured with tan legs. Weight 15 to 20 lb.

Clynes, John Robert, Brit. statesman, was b. at Oldham, March 27, 1869; son of Patrick Clynes, who had been evicted from his holding in Ireland in 1851, and had become a labourer in the employ of Oldham Corporation. J. R. C. attended St. Anne's elementary school when a half-timer in a cotton mill; but he began self-education as a piecer aged seventeen. He was small and weak for his age. Under the name of 'Piecer' he contributed to the correspondence columns of Oldham papers. He took part in the estab. of a (short-lived) Piecers' Union, which helped to make a speaker of him. He was enlisted by Will Thorne, M.P., as an unpaid speaker at his organising meetings of the Gas and General Workers throughout Lancashire. At twenty-two he was appointed organiser at 30s. a week; he held the post for six years, and then became secretary of the Lancashire dist. of the union. He tried repeatedly but unsuccessfully to enter Oldham tn. council. He held the secretaryship of Oldham Trades and Labour Council for twenty-one years. In 1906, he won, at first an empty, a parl. seat, becoming Labour member for N.E. Manchester—a constituency he represented till his disappearance in 1918; after that he sat for the Plating div. He was parl. secretary to the Ministry of Food, 1917-18; became food controller (and Privy Councillor) in the latter year, but resigned at the call of party. Vice-chairman of the Labour party, 1919; chairman, 1921—but in 1922 was relegated to deputy-chairmanship. In Labour Gov. of 1924 was Lord Privy Seal and deputy-leader of Commons. When the party took office again in 1929, he became home secretary. In 1931 he introduced a Bill to legalise Sunday entertainments. Defeated in general election, 1931, but elected in 1935. He did not contest the general election of 1945. Pub. his *Memoirs* in 1935. He is president of the National Union of Municipal Workers.

Clypeus Sobieski (Lat. *clypeus*, a shield), constellation formed by Hevelius (1611-1687) out of some small stars below Aquila. It was named in honour of John Sobieski III., king of Poland (1674-96).

Clysters, or **Enemas**, are liquid medicines which are introduced by means of an enema syringe into the lower end of the intestines or the rectum. The injection may be made for various purposes, and is generally made when the ordinary method of taking is impossible owing to the condition of the patient; thus, for the purpose of evacuating the bowels in cases of constipation, or for conveying stimulants into the system, and in cases of diarrhoea. Warm water is the common form of C. for evacuation, and beef-tea for strengthening. The use of C. is much more common in France, where they are termed *lavements*.

Clytemnestra, daughter of Leda, wife of Tyndareus, king of Sparta, by Jupiter,

and the sister of Castor. C. married Agamemnon, king of Argos. During the absence of Agamemnon at Troy, C. formed a guilty connection with his cousin, Ægisthus, and to save herself, on his return murdered him in his bath (according to some accounts the murder was committed in revenge for the supposed sacrifice of her beloved daughter, Iphigenia). C. then married Ægisthus, who usurped the throne of Argos. Orestes, her son, concealed himself in the house of his sister Electra, and killed the guilty pair on their way from the temple of Apollo. See AGAMEMNON; ÆGISTHUS; ELECTRA; IPHIGENIA; ORESTES.

Clytie, sea-nymph, daughter of Oceanus, in love with Apollo, who deserted her for Leucothoe. She pined and was eventually turned into a sunflower or heliotropium.

Cnidoblasts, see THREAD CRILLS.

Cnidus (Κνίδος), anct. Gk. city on the coast of Caria, Asia Minor, at the end of the peninsula of Triopium (Cape Krio); colonised from the Peloponnesus, said to be both Laconian and Argolic. One of the six cities of the Dorian League. Originally on an is. the settlement spread to the mainland. The city was famed for its worship of Aphrodite, her celebrated statue (by Praxiteles) being in one of its temples. In 394 B.C. the Athenian admiral Conon, commanding a Persian fleet, defeated the Spartan fleet under Pisander near C. The fine seated statue of Demeter (Brit. Museum) was excavated from the ruins of C. See C. T. Newton and R. P. Pullen, *Discoveries at Halicarnassus, Cnidus, and Branchidæ*, 1862-63; and *Travels and Discoveries in the Levant*, 1865.

Cnosus, **Gnosus**, or **Knossos**, anct. tn. of Crete, sometimes called *Cærat*, from the small riv. which flowed beneath its walls. Its foundation is attributed to Minos, king of Crete. The locality was the scene of the birth of Jupiter and of his marriage with Hera. The Cretan labyrinth, built by Dædalus, and the abode of the Minotaur, was also attributed to C. the explanation of the origin of this legend is given by Dr. Evans in his account of the excavations, *Scripta Minoa* (1909). It was peopled by Dorians, was prominent in the civil wars of Crete, and finally became a Rom. colony. See also CRETE.

Coach and **Coaching** (*Magyar kocsi*, the kind of vehicle used at Kocs, W. Hungary, fifteenth century). A coach is a large, enclosed four-wheeled carriage for passengers. As a general term it may be used for all carriages (e.g. in C.-building), or combined with other words for special forms (e.g. stage-C., mail-C., hackney-C., mourning-C.). The typical C., however, has as special characteristics four wheels, springs, a roof forming part of the framing of the body, and more than one seat for passengers. It was perhaps a later development of the huge agric. wagons in use on the Continent in the twelfth and thirteenth centuries. In the Middle Ages very elaborate Cs. were used by royalty and nobility and for State purposes. The first C. in England was made by Walter

Rippon (1555) for the earl of Rutland; in 1564 he also made one for Elizabeth. The stage-C. had seats outside and in, and was much used in England as a public conveyance from the sixteenth century. At least six existed in 1675, but they did not enter very largely into Eng. life till the eighteenth century. In earlier times broad-wheeled vans or wagons were used to convey passengers who could not afford to travel on horseback. Fares were naturally very high, as the pace was slow. At first there were no actual seats outside,

came into use (c. 1840) Cs. had regular routes all over the country; similar ones were used in America and on the Continent, where alternative names, such as *Diligence*, *Stellwagen*, and *Ekuvagen*, were used for vehicles of the kind. The earliest railway vehicles were merely road Cs. adapted to run on rails. In the United Kingdom the two best-known Cs. of historical interest are the king's state C., and the lord mayor's (which figures yearly in the procession of the lord mayor of London, Nov. 9). This is the oldest, first



Corporation of London: Guildhall Library

MEETING OF THE FOUR-IN-HAND CLUB, HYDE PARK, LONDON

An aquatint by J. Harris after James Pollard

but 'outsides' were taken at a reduced rate (about half-price), and had to cling on by the luggage as best they could. In 1767 a basket, called the conveyency, was attached to the back of the C. for half-price passengers. In 1659 the first stage-C. ran between London and Coventry. In 1784 the mail-C. system was introduced by John Palmer, M.P. for Bath, to replace the post-boys who were employed up to that time. The post office vehemently opposed his suggestion, but it was carried out, the first mail-C. running between London and Bristol in 1784. In 1789 springs were introduced by John Warde, the 'father of fox-hunting.' Tubb and Davis's 'machine' was one of the first fast Cs. that ran between London and Brighton. In 1791 lighter vehicles were introduced. Some Cs. took only eleven hours to Brighton from London, 'flying' Cs. could even do it in eight. The fare for a single journey was 14s. or 16s. Before railways

used for the procession of Sir Charles Asgill, lord mayor elect, 1757. The body is hung on leather straps, and has much ornamental carving, gilding, and paintwork. The panels and doors are covered with various allegorical groups of figures and heraldic devices. The king's C. was designed by Sir Wm. Chambers and described as 'the most superb carriage ever built.' The paintings were done by Cipriani, the whole being completed in 1761. In the later years of Victoria's reign it was rarely seen, but on the accession of Edward VII. it was again made fit for use on State occasions. In 1824 the art of coaching had been perfected; it was often a form of sport, and the custom of driving for high wagers was very popular. When steam conveyances had ousted mail-Cs. as a necessity, coaching still continued to a certain extent as an amusement for the richer classes. In the early nineteenth century McAdam and Telford improved road-making to such an

extent that the conditions for driving were much pleasanter. Considering the unprotected state of the roads, highway robberies were not so frequent as might be expected, though, of course, many tales of them survive (Dick Turpin). Much skill was needed to drive four horses, and the difficulties and humours of 'the road' are very often referred to in Eng. literature. From the sense of driving, the word C. came to be applied to a tutor for examinations or for athletic contests, especially rowing (army C., varsity boat-race C.). By 1824 over 300 Cs. used to pass Hyde Park daily. The most famous coaching-clubs of England have been the old Bensington Driving Club, 1807-52, and the Four Horse Club, 1808-29. These drove a kind of landau. The Richmond Driving Club (promoted by Lord Chesterfield) was instituted in 1838. The Four-in-Hand Club was started in 1856, with the duke of Beaufort as president, and the Coaching Club in 1870. In America the New York Coaching Club was formed in 1875. Coaching was chiefly the sport of the richer classes, but has been ousted by motoring. From 1896 coaching became a favourite pastime of Amer. millionaires, but its true home was in England. Professional drivers of the 'Brighton Age' were Charles Jones, Sir St. Vincent Cotton, Dick Brackenbury, and others. Robert Parks for eighteen seasons in succession drove the C. from Keswick Hotel to Windermere and back (42½ m.) every week-day. The last sensational driving-match was in July 1888, when James Selby drove the 'Old Times' from London to Brighton in 3 hrs. 56 min., and back in 3 hrs. 54 min. The average speed is 10 to 11 m.p.h. In some parts of England (London to Brighton, Lake Dist.), in America and Europe, public Cs. ran until comparatively recent years at regular times along certain routes. A modern C. has two parts, the carriage and the body. The latter usually measures 4 ft. 10 in. long, 4 ft. wide, 4 ft. 2 in. high. They have brakes, but good drivers only need them in emergencies. The Amer. Concord C. has no springs, but leather straps. See *New Remarks on London*, by the Company of Par. Clerks, issued 1732; 'Nimrod' (C. J. Apperley), *Essays on the Road*, 1876; duke of Beaufort, *Driving* (Badminton Library), 1889; F. Rogers, *Manual of Driving*, 1900; R. Straus, *Carriages and Coaches*, 1912; H. Belloc, *The Highway and its Vehicles*, 1926; T. Read, *The Evolution of Horse-drawn Vehicles*, 1933; O. O. Winthor, *Express and Stage-coach Days in California, 1835-1860*, 1936; B. Darwin, *British Clubs*, 1943; H. McCausland, *The English Carriage*, 1948.

Coach-building, or Coach-making, name given to the carriage-manufacturing industry. As a matter of fact, C. calls for the services of craftsmen in many different trades. The variety of materials used in the manuf. of a first-class carriage is so great—iron, steel, silk, leather, glass, etc., being utilised—that many classes of highly skilled labour are employed. Body-makers manufacture the part where the

persons are seated, carriage-makers the parts on which the body rests, and wheelwrights, joiners, and fitters, sev. classes of smiths, painters, and trimmers, all are needed. Various thicknesses of planks are used, and for every inch of thickness a year is required to season the wood effectively. Ash is the best wood; for the body a full-grown variety of a mild nature is used, and for the carriage poles younger, straight, and tougher pieces. The framework of the body is panelled with quarter-inch planks of Honduras mahogany with no grain; this is then coated with ground white lead until it is completely weather-proof. The roof is covered with wide pine boards, a quarter of an inch thick, and three thicknesses of wood, exceedingly thin, are then glued together under pressure, so that the grain of the centre piece runs across that of the outer pieces. Thus a good solid covering without joints is obtained. Birch and elm are also used, and pine for the flooring-boards. It is perhaps in the wheel-making dept. that most improvements can be traced in carriage-making. For the nave of a wheel, wych elm is the best wood; heart of oak is used for the spokes, and ash for the felloes. For light wheels Amer. hickory has been much used of late years, and the Amer. method of making the wheel in two sections is also an improvement for this class. The Warner nave is a solid iron casting, with mortices for the spokes; this also is more used on light carriages. When indiarubber tyres are used, the felloes need not be so deep as in the case of metal. The best springs are made of Swedish ore, though Eng. spring steel is very good. Axle-trees are of two kinds, mail and colling; the former are secured to the wheel by three bolts through the nave, the latter by a gun-metal cone secured by colls and nuts. Cast, chilled, or wrought iron is the material used for axle-boxes, the first being the cheapest. The painting of a carriage is most delicate work, and a special class of painters is employed to paint the coats of arms when required; these are known as heraldry painters. The wood-work is first treated with copal varnishes, and then with successive coats of paint; in first-class work as many as twenty coats are applied. After a year's wear, the gloss of the work may be revived by rubbing with oil and rotten stone; this is a delicate process, requiring highly skilled labour. The interior of a modern carriage is more luxurious than formerly; satin and tabaret were largely used in the nineteenth century, but morocco superseded them as seat material; silk curtains, carpet, electric light, flower-vases, etc., complete the furnishings.

Coadjutor, assistant of a bishop who is unable to perform his work owing to either ill-health or old age. He often succeeds to the bishop's see when that dignity dies.

Coagulation, change which occurs in the physical properties of certain proteins when heated or subjected to various chemical actions. The typical examples are egg-albumin, or white of egg, which is

a colourless, sticky fluid, miscible in water at ordinary temps., but solidifying into an opaque white mass when placed in boiling water; and blood-albumin, which clots on exposure to the air, thus serving a useful purpose in preventing escape of blood from small wounds.

Coahuila, one of the twenty-seven states of Mexico in N. America. It lies inland, and is bounded on the N. by the U.S.A., and has an area of 62,376 sq. m. The climate is salubrious, although there are somewhat rapid changes in the thermometer. Agriculture and cattle-farming form the chief occupations. It is the only Mexican state in which coal is produced (856,000 metric tons in 1941). This state is rising in importance owing to the extensive railway development; it possesses five dists., and the chief products are cotton, wheat, maize, sugar, and linseed. Its cap. is Saltillo (50,000). Pop. (1940) 550,700.

Coal, meaning, in its broad sense, any fuel, is used in England to signify that form of fuel which is obtained as a mineral from pits. This form of fuel is one of the organically formed rocks, and occurs chiefly in the Carboniferous system, or rather in the C. measures. As can be inferred from this, C. chiefly consists of carbon, and is regarded as being derived from plant remains. It is a black or blackish-brown rock, with a low specific gravity, and having hydrogen and oxygen as its chief constituents other than carbon, and it is now the prin. domestic and commercial fuel. C. may be divided into two classes: (1) *Bituminous*, (2) *Anthracite*; while *lignite*, or brown C., may be taken as a stage in the process of the conversion of vegetable matter into bituminous C. Graphite would further be added by some authorities as the final stage in the transition. The most general theory of the formation of C. is that which considers that in the Carboniferous age great masses of luxuriant vegetation grew near sea levels. In the process of time the land covered with this vegetation became submerged, and sediments of mud and sand, etc., formed over it. By processes, again well known to geologists, this land became raised again above sea level, and new vegetation grew, which, in its turn, would undergo a similar treatment to the other. These processes would at length produce stratified measures, which, under the ensuing great pressure and certain chemical changes which would inevitably be caused, would

result in the formation of seams of C. From microscopical examinations it may be inferred that a large number of the C. seams were formed from great jungles and swamps. Now, if wood, peat, lignite, bituminous and anthracite Cs., and graphite be analysed, a table similar to that below (compiled by Prof. J. W. Gregory) may be obtained if the small amounts of nitrogen and sulphur be neglected.

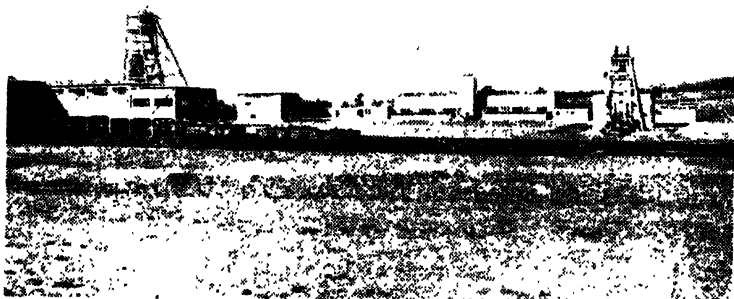
It may be stated as a general truth that anthracite is always found deeper in the earth than bituminous, bituminous than lignite, and that peat is found on the surface. Of course this generality is not always borne out, but this fact and the above table uphold the generally accepted theory that hydrogen and oxygen are, by heat and pressure, caused to separate from the vegetable matter as marsh gas and carbon dioxide. The deeper the layer the greater the heat and the pressure, and as a result the greater is the evolution of the separating gases. As this process proceeds it is evident that an increasing percentage of the C. will be carbon, the sp. gr. will rise, the colour darken, and we shall arrive at a rock formation. If the leaves and branches of trees accumulate a mould will be formed which will be rich in carbon, while mosses growing in swamps will form peat. If either or both be buried, the carbonaceous layer will be preserved. As stated above, heat and pressure will cause some of the volatile elements (oxygen and hydrogen) to pass off, leaving lignite. Greater pressure will resolve this into bituminous C., while the same process intensified will produce the hard lustrous form of C. known as anthracite, which is free of dust and will burn without smoke or flame. It might also be formed by the intrusion of igneous rock. Igneous rock, having intense heat, flowing into dykes in this anthracite would convert it into graphite, which is practically pure carbon. This theory is partly illustrated in the S. Wales coal-field. If we pass from the S.E. to the N.W. of the field, we pass from bituminous C. seams through steam C. to the anthracite, steam C. being intermediate in composition and properties between the bituminous and anthracite. It may be pointed out here, though that not all graphite formations can be ascribed to this process of formation; and in some cases it may be noticed that anthracite and bituminous C. occur together, and seem to have been formed under the same conditions. Greater heat and pressure

	Carbon per cent	Hydrogen per cent	Oxygen per cent	Ash per cent	Moisture per cent
Air-dried Wood . . .	39	4.5	35.5	1	20
Air-dried Peat . . .	44.5	4.5	26.5	8.5	16
Air-dried Lignite . . .	45	3.75	26.25	10*	15
Bituminous Coal . . .	72	4.0	11.0	10*	3
Anthracite . . .	91.5	2.5	1.0	3	2
Graphite . . .	95	—	—	5	—

* Very variable

not accounting for these cases, it has been thought that in these cases, and perhaps in all, anthracite C. is formed from a different kind of vegetation from that which gives bituminous C., although this has not yet been thoroughly proved. Microscopic examination shows that C. consists of four main constituents, called durain, clarain, fusain, and vitrain. As a whole, C. appears to be a colloidal substance (see COLLOIDS), but the general structure is so complicated and so variable that the problem of its constitution can hardly yet be said to have advanced beyond the fringe of a solution.

will give a percentage of ash of ten or under. This ash, or incombustible inorganic matter, occurs in all Cs., and consists of sand and mud which has mixed with the layer of C. at the time of its formation. In some Cs. (mainly continental) the percentage of ash may rise to over thirty. When a large amount of these impurities enter, causing a great lowering of the value of the seam as fuel, it is called bituminous shale or sandstone, not C. From some of these shales and cannel C., oil is obtained by processes of distillation. Bituminous Cs. are also used for obtaining gas. They are heated in



COMRIE COLLIERY, FIFE, SCOTLAND

General view, showing the two shafts and pithead baths.

National Coal Board

All C., as would be expected from its vegetable origin, contains a proportion of nitrogen, and is important as the source of the ammonia obtained as a by-product in the manuf. of C. gas.

The effect of heat on C. in the absence of air varies according to the conditions, especially the temp. (see CARBONISATION (Low Temperature)). Gaseous and liquid products are always found, however (see GAS MANUFACTURE and COAL TAR), while a residue of coke is left in the retorts.

Lignites (q.v.).—Taking our div. of the kinds of C., lignite would first demand attention. It is sometimes termed brown C., although it is inferior altogether to true C. It is, however, used a good deal in N. America, where a variety is found which cokes well and is a good substitute for C.

Bituminous coals form the greater part of the C. measures, and are the forms in general use for domestic and commercial purposes. They are black, brittle, and opaque, and have a cross-jointed structure,

closed ovens, and the C. gas, together with C. tar and ammonia, is formed, leaving coke as a residue. This coke is practically carbon, and is used in smelting. There are many different varieties of bituminous C., and sev. ways of classifying them are adopted. In S. Wales the general classification would be into house C. and steam C. Under the first heading would be placed all those Cs. with a fairly low percentage of carbon which, possessing comparatively large amounts of gas occluded in them, will burn with a large amount of flame. These seams are found all over the coal-field, and are those nearest the surface, in some places outcropping from the mt. side. The steam C., on the other hand, is always derived from pits of a fair depth. It has a higher percentage of carbon, is harder, and has a greater lustre; and as a consequence of its comparatively small amount of composing gases, it burns without a great deal of flame or smoke, and has a greater amount of available heat. Local names are given to those seams which are first worked near them, and these names remain with the seams

wherever they may be worked. This holds good everywhere, as will be seen from the names Wallsend, Derby Brights, Mynyddyslwyn, etc. To take an example, the Mynyddyslwyn is regarded as being perhaps the finest house C. found in Wales, but it is not worked near the place of that name now. It was at first, and the name has remained. As has been stated before, steam C. is intermediate between bituminous and anthracite C., and the finest steam C. in the world is that found in S. Wales and Monmouthshire. While it is true to say that progressing from the S.E. to the N.W. in this field results in passing from bituminous to anthracite C., it would probably be truer to say that while only anthracite is found in the W., bituminous and steam C. (if steam C. be considered as distinct from bituminous), or house and steam C. (if the distinction be not recognised) can be found right to the E. of the field. The Monmouthshire coal-field contains vast supplies of steam C., which are not inferior to those of Glamorgan, and they are at present being developed. Another mode of distinguishing varieties of bituminous C. is that of dividing them into caking and non-caking Cs. This has an economic value. Caking Cs. require a great deal of work in stoking, since while they will burn freely, with great flame and smoke, at the same time they will cake up together into clinkers. These prevent perfect combustion, and, further, require a deal of efforts to free them in some cases from the fire-bars. Non-caking Cs. burn free, and since the ash remains separate, are easy to stoke. To obtain the good qualities of the caking and the non-caking Cs. mixtures are made of different varieties. Newcastle C. is among the caking varieties. Among other well-known forms of bituminous C. may be mentioned splint C. This is a hard C., found in Scotland, which is used in smelting as the cokes of other Cs. would be. Then there is that known as cannel C., which may have obtained its name from the tradition that, since it burns with a bright flame like a candle, torches used to be made of it. It also burns with a crackling noise, and is therefore sometimes known as parrot C. It is hard, and does not soil the fingers, and some forms of it can be polished and made into inkstands, etc. Some forms of Amer. C. are capable of this also. It is much used as a gas-producing C., and also in some dists. for burning in open grates.

Anthracite is a hard, rocky form of C. with an almost metallic lustre. It is difficult to kindle, but when burning it gives out great heat. It is found in the W. of the S. Wales coal-field and also in America. It burns practically without smoke and flame, and has a greater heating power than any other form of C.

Heating Power of Coal.—C. is judged by the number of pounds of water which will be raised 1° F. by the burning of 1 lb. of the fuel, by the amount of water evaporated at 212° F. by 1 lb. of it, and these tests are always carried out on boilers of the type in which it is to be used, for it is

found that the heating power of any variety of C. varies considerably, according to the conditions under which it is to be burnt. See W. A. Bone, *Coal and its Scientific Uses*, 1918; E. S. Moore, *Coal, its Properties, Analyses, etc.*, 1922; A. L. Summers, *Anthracite*, 1922; W. A. Bone and G. W. Himus, *Coal, its Constitution and Uses*, 1936. See also bibliographies for COAL-FIELDS; COAL SUPPLIES; COAL-MINING.

Coalbrookdale, dist. in Shropshire owning an iron industry, situated on the banks of the Severn for a distance of 8 m. along its course. The vil. of that name is 11 m. from Shrewsbury. Pop. 1400.

Coal-fields are constituted of those areas where the coal-bearing strata appear at the surface, or where their coal and ironstones can be worked at a profit. In England very few workable seams are found lower than the coal measures or the Upper Carboniferous div. of the Carboniferous system. The two other divs. are the millstone grit and the carboniferous limestone. In Scotland, however, valuable seams are found lower than the millstone grit, while oil shale is obtained even below the Carboniferous limestone. Coal is, however, worked from other strata both older and younger than the Carboniferous, being worked from the Devonian, Miocene, Pliocene, Oolitic, and other formations, although coal obtained from these seams is of relatively small commercial value as compared with that obtained from the coal measures. It may here be noticed that C. are usually found in the form of a syncline or basin, dipping inwards at the edges and lying more or less level at the centre, thus causing the seams to crop out very frequently at the surface. This gives rise to two important factors: (1) it allows the coal to be easily reached and worked, because but for this fact a large amount of it would be too deep in the earth to be reached; and (2) it has saved the C. from the destroying effects of denudation, to which they would have been very susceptible owing to the comparative softness of the coal-bearing strata. Coal is, of course, the chief mineral wealth of the Brit. Isles, and is the source of its commercial prosperity. Among the many C. in the Brit. Isles are the following: in the neighbourhood of the Bristol Channel, the S. Wales coal-field, and that of the Forest of Dean, with a small one at Bristol; in the Midlands occur the C. of Leicestershire, E. Warwickshire, S. Staffordshire, Coalbrookdale, Shrewsbury, and Flint; around the Pennine chain occur those of N. Staffordshire, Yorkshire, Lancashire, Durham, Northumberland, and Cumberland; in Scotland occur the Lanarkshire, Ayrshire, and Fifeshire, and in Ireland the Tyrone, Kilkenny, and Clare C. The S. Wales coal-field is famous all over the world as providing the greater proportion of the steam and anthracite coals used in the various mercantile marines and navies, while at the same time it provides coals of the kinds suited for smelting, manufacturing, and

house coals, together with those varieties used in the production of gas. The coal from the Midlands and the N. is generally used in all these branches, except that it is not of such great value for shipping purposes, and that it is chiefly used in the great manufacturing and engineering centres of the N. Large quantities are exported from S. Wales all over the world, and from the fields of Fife-shire and the N.E. of England thousands of tons are exported to the Continent. The largest C. are probably those of America, which are over eighty times as large as the whole of those of Great Britain, covering as they do nearly 200,000 sq. m. The term coal is used in the U.S.A. with no such narrow restriction as in England to varieties occurring in the older Carboniferous formations; but, as on the Continent of Europe, includes anthracite and bituminous coals, lignitic coal, cannel coal, and ordinary lignite, or, in other words, embraces both the black or stone coal of Great Britain and the so-called brown coal of the continent. The coal output of the U.S.A., no less than the splendid quality of the numerous varieties, surpasses that of any other country. The coal-bearing areas are to be found scattered over more than thirty of the states, and indeed it is only in a few of the New England states that no coal occurs. The Appalachian mt. system, extending from E. Pennsylvania to the S., indicates the line of the prin. coal-bearing country, and it is here that the most valuable deposits of hard anthracite are to be found. The group of fields of next importance is the E. interior group in Illinois, Kentucky, Indiana, Ohio, where are to be found the best qualities of bituminous and cannel coal. In the W. interior group of Missouri, Iowa, Kansas, the output of the same varieties is no less important. Next in importance come the large lignitic and bituminous C. of Arkansas, Texas, Oklahoma, Colorado, and New Mexico, which last-mentioned fields continue along the line of the Rockies northward into Canada. Anthracite also occurs in Massachusetts, Arkansas, and Virginia; bituminous coal in Nebraska, Michigan, and Alabama; and lignitic coal in nearly all the states W. of 105° W. long., especially New Mexico, Colorado, California, and Utah. Lignite is found mainly in the W. states. Speaking geologically, the better qualities of both the anthracite and bituminous coals belong to the Carboniferous formations, but the quality varies only to a very uncertain degree with the geologic age, and it is curious that whereas up to about 1870 more anthracite was mined in Pennsylvania than bituminous coal throughout

the country, since that year the production of bituminous coal has far exceeded the former. According to the U.S. Geological Survey, the geologic age of the coal-beds ranges from Carboniferous in the Appalachian and Mississippi valley provs. to Miocene on the Atlantic coast provs. After Great Britain and the U.S.A., Germany (prior to the Second World War) was the prin. exporting country, and remained so, after having lost, as a result of the First World War, the Alsace-Lorraine coal-field, the Saar dist., and almost the whole of the coal-field of Upper Silesia. (See statistics under COAL SUPPLIES.) The partition of Silesia, with its rich coal-field, was hotly contested after the First World War, and settlement was attempted by plebiscite in 1920. Eventually the mining area of Teschen, Lower Silesia, formerly Austrian, was allotted to Czechoslovakia, already rich in minerals, while Upper Silesia, formerly Ger., was given to Poland. Other productive European fields are located in Belgium (Charleroi, Mons, Liège; and the Kempen, yet to be exploited), France (St. Etienne), Germany (Westphalia and Rhineland), Spain (Asturias), and Russia (Donetz), while coal is also found in the Alps, the Urals, and even at Spitzbergen. Other C. are those in China, India, Japan, the Malay Archipelago, Australia, New Zealand, S. Africa, and Canada. Most of the Chinese provs. contain coal, and China, judging by its immense estimated resources, may be regarded as one of the leading coal countries of the world. Japan and India, however, actually produce considerably more coal than China. Except in Nigeria, little C. is produced in the Brit. Colonial Empire. Coal exports are believed to be extensive in the S.W. of Tanganyika, but conditions are unfavourable for their development. Coal is not the only commercial product obtained in the C., for included in the same strata are ironstone, oil shale, fire-clay, sandstone, and igneous rocks which supply a good paving and building stone. In fact the oil shales and sandstones usually make up by far the greatest proportion of the thickness of the coal-bearing strata. See also GEOLOGY; CARBONIFEROUS SYSTEM. See Sir A. G. Ramsay, *Physical Geography and Geology of Great Britain*, 1863; J. Park, *Mining Geology*, 1918; E. A. N. Arber, *The Natural History of Coal*, 1912; J. Lomax, *Microstructure of a Coal Seam*, 1925; E. A. Martin, *Coal and its Story*, 1926; B. E. Dahlgren, *A Forest of the Coal Age*, 1933; and S. H. Cox, *Prospecting for Minerals*, 1903. See also bibliographies for COAL; COAL-MINING; COAL SUPPLIES.